

New York Show Issue

DETROIT PUBLIC LIBRARY
AUTOMOTIVE HISTORY COLLECTION

MOTOR AGE

Vol. XLV
Number 1

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, JANUARY 3, 1924

Thirty-five Cents a Copy
Three Dollars a Year

AN ACKNOWLEDGMENT

If we could reach every one of the men who have helped make this the greatest year in Champion history, one hundred thousand telegrams of acknowledgment and appreciation would go out of the offices of the Champion Spark Plug Company today.

Wherever they are, we want each and every one of these men to know that they are in our thoughts today, and that while we have prospered together, we do not feel that our debt of obligation is entirely discharged by monetary considerations.

In the distribution of Champion Spark Plugs—in the wonderful work accomplished by the great wholesale and specialty houses, by thousands of retailers and their thousands of representatives—there have been elements of friendliness and loyalty for which we

can offer no compensation but our thanks.

It is perfectly true, as we Americans so often say, that business is business—but it is also true of this business that the kindly human relations which it has brought into existence constitute by far its most precious asset.

It would be easy to say:—"We gave you what you wanted, and what the public wanted. We helped you with every means in our power, to prosper as you helped us to prosper—and so consider the account balanced."

But, we are not disposed to consider it balanced, and so to those who distributed and sold and those who bought this year 35,000,000 Champion Spark Plugs, our very sincere appreciation and all good wishes.

P. G. Stenham
President



V. 451 Jan-Feb 1934

Wrecking Cranes!



Get a Manley

Ask your jobber to explain the advantages of the new Manley Swivel Nose Wrecking Crane.

If you want all the additional business a wrecking crane can get you, write for our booklet: "How to 'Cash in' on a Manley Wrecking Crane."

Your own jobber can supply
Manley Equipment without
delay.

Manley
Mfg. Co.
York, Pa.



THERE will be two million more cars on the road next year.

There are more accidents in a large city than in a small town because there are more people and more congestion.

More cars on the road and more congestion is sure to mean more wrecks.

Without a wrecking crane you cannot expect to get any of these profitable rebuilding jobs.

With a poorly designed and constructed crane you will eventually get into trouble.

A GOOD CRANE must pull out the wreck and hoist it quickly and easily.

A GOOD CRANE avoids danger of further damage to car and people in handling.

A GOOD CRANE, properly mounted, standing at your curb is one of your best advertisements.

That's why
we say:—



This is the Lyon-patented End-Fold. Gives the Lyon Parallel Bumper distinctive look and unequal strength at the ends.

Remember These Facts When You See the Lyon Display

EVERY important development in bumper construction has been made by Lyon.

Lyon invented the resilient bumper. The features of Lyon construction gave the bumper grace, symmetry and perfect balance—Lyon created bumper beauty. And the simplest and quickest methods of attaching these bumpers to all makes of cars.

The newest Lyon achievement is the Lyon End-Fold Parallel Bumper. It is the first, built on the resilient principle, that affords uniform protection from end to end. The Lyon-patented End-Folds have brought this about. They have also sounded

a new note in smartness and distinctive appearance.

Lyon leadership has a very definite advantage for you. Lyon Spring Bumpers are an aggressive product. You can sell them aggressively. They lead all others in sales. There are well over a million in use. Did you get some of those Lyon profits? If not, start right now. Millions of cars need the protection and beauty of Lyon Spring Bumpers. You know there are a lot of those cars in your neighborhood. Write your jobber to-day for complete information on the whole Lyon assortment. Ask for the Lyon Catalog No. 36.

All Lyon models are displayed at the New York Show, spaces 100 and 101, and at the Chicago Show, space 78.

METAL STAMPING COMPANY, Long Island City, New York
Canadian Licensee, B. J. Coghlin Co., Ltd., Montreal

LYON RESILIENT BUMPER

This Burroughs is Within Your Reach— Now!



\$12.50 Down Puts It To Work For You!

You cannot afford to be without this standard Burroughs at its remarkably low price! It will help you take inventory, estimate profits by departments, and balance ledger accounts! It will give you, quickly and accurately, the figures necessary to prepare a statement for your banker, or for your income tax return! It will help you figure labor and material costs and do away with lost time and lost parts.

Think of it—only \$12.50 down and easy monthly payments, starts this machine making and saving money for you! The price is only \$125. Investigate its possibilities at once.

If you're in one of the 205 cities where there is a Burroughs office, phone us. Otherwise, ask your banker for the address of our nearest office. Or, if you prefer, simply sign the coupon below and we will immediately send you information telling how this machine is making money for other garages and accessory stores.

Burroughs
Adding
Machine Co.
6130 Second Blvd.
Detroit, Michigan

Please tell me how other
men in the Automotive Busi-
ness are using Burroughs machines
to make more money.

Name _____

Address _____

Burroughs

Adding



Machines

Bookkeeping



Machines

Better
Figures
make
Bigger
Profits

Calculating



Machines

Billing



Machines

MOTOR AGE

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A CONTRACT THAT IS AN ASSET

DOING business with an old and powerful manufacturer is itself an asset. To sell Silvertowns, and have your business linked with the most outstanding and significant name in the tire business is the most valuable advertising asset a dealer can have. To do both under the Goodrich 1924 Contract is an unbeatable combination.

The foundation of the Goodrich 1924 Proposition is a universal price to all contract dealers. You know that your price is the best Goodrich quotes anybody and nobody can purchase Goodrich Tires for less. Liberal dating during the winter and complete price protection, quick branch house distribution make for your stability and profit.

There is a lot in the Goodrich 1924 Proposition to interest you personally.

THE B. F. GOODRICH RUBBER COMPANY
ESTABLISHED 1870

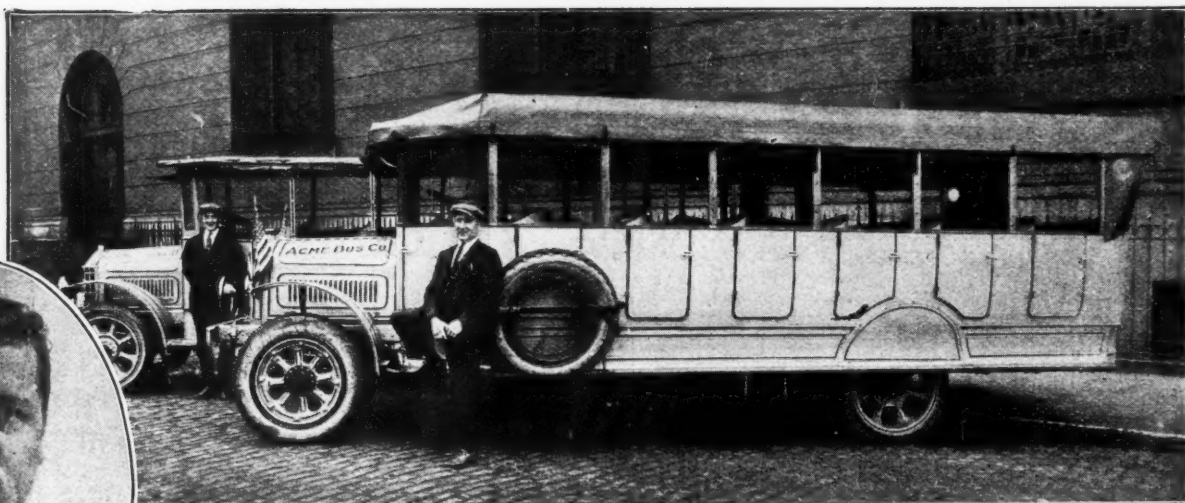
Goodrich

TIRES

"Best in the Long Run"



A. C. KOHLER
President Acme Bus
and Sightseeing Co.,
Inc., New York,
operating a fleet of
sightseeing buses.



Kohler says: TaxitruX "Lasts Far Longer"

"WE have been using Multibestos TaxitruX Brake Lining on all of our buses for the past eight months. During this time it has been put to the severest kind of test, for the handling of heavy buses in crowded city streets calls for almost continual use of brakes.

"As a result of this experience, we wish to say that no lining we have ever used has given us the satisfaction that TaxitruX has given and is still giving. It never fails to take hold, and it lasts far longer than the usual linings.

"We are strongly sold on TaxitruX."

Very truly yours,
(Signed) ARTHUR C. KOHLER.

Drivers of buses, trucks, taxis and all heavy duty vehicles have to shoulder the

bulk of responsibility for traffic safety. Their brakes must be 100% efficient at all times. Multibestos TaxitruX is a brake lining built especially to meet this need. It has all the Multibestos advantages—*asbestos of highest quality built into a solid fabric by the Multibestos Interlocking Weave. And it has another big advantage—it contains 50% more asbestos than ordinary brake linings.*

This is why Multibestos TaxitruX makes your brakes work more surely and lasts twice as long as ordinary linings, thus making it the most economical to buy.

Let us send you figures showing what taxicab, truck and bus fleet owners are saving in time and money by using TaxitruX. Write us today.

MULTIBESTOS TAXITRUX Brake Lining

MULTIBESTOS COMPANY

Department MA1

Walpole, Mass., U.S.A.

NEW YORK
105 West 63rd Street

CHICAGO
1241 Michigan Avenue

NASHVILLE
1200 Broadway

DETROIT
930 Taylor Avenue

SAN FRANCISCO
1035 Polk Street

EXPORT OFFICE—461 Eighth Avenue, New York



Made of many, many
strands of asbestos yarn
woven and compressed
compactly—no filler.

A Foundation Upon Which to Build Success

Some one has said that the dealer who cannot make a success selling Studebakers has no future in the automobile business.

We would put it another way—

We sincerely believe that any business man who exerts proper effort and follows ordinary business principles can make a greater success with the Studebaker franchise than with any other line.

This belief is founded on the fact that Studebaker dealers are universally successful.

The stability of the manufacturer is a bigger factor today in the sale of motor cars than ever before. The actual net assets employed in the Studebaker business exceed \$90,000,000 against which there is no indebtedness.

With \$50,000,000 invested in plants and facilities and an organization of able, experienced men, Studebaker is in a position to manufacture economically and give the greatest intrinsic value possible for a given price.

The Studebaker line—three models in thirteen body types—the only *complete* line, enables the dealer to get his share of *all* the business in his territory.

These are factors that the dealer who is looking to the future should consider.

A postal card will bring a man to you who will tell you the details of this wonderful proposition—without obligation, of course. Tomorrow may be one day too late.

1924 MODELS AND PRICES—f. o. b. factory					
LIGHT-SIX 5-Pass., 112" W. B., 40 H. P.		SPECIAL-SIX 5-Pass., 119" W. B., 50 H. P.		BIG-SIX 7-Pass., 126" W. B., 60 H. P.	
Touring.....	\$995	Touring.....	\$1350	Touring.....	\$1750
Roadster (3-Pass.).....	975	Roadster (2-Pass.).....	1325	Speedster (5-Pass.).....	1835
Coupe-Roadster (2-Pass.).....	1195	Coupe (5-Pass.).....	1895	Coupe (5-Pass.).....	2495
Coupe (5-Pass.).....	1395	Sedan.....	1985	Sedan.....	2685
Sedan.....	1485				

THE STUDEBAKER CORPORATION OF AMERICA
South Bend, Indiana

Studebaker

T H I S I S A S T U D E B A K E R Y E A R

NASH

ANNOUNCES



A Low-Priced, Beautifully Built Nash Six 4-Door Special Sedan

The introduction of this new model is a decisive stroke well calculated to give Nash dealers a motor car value that is certain immediately to stimulate their sales and widen their market.

Because of the character of the car plus its remarkably low price it is sure to command a volume of sales twice the size created by the Four-Door Coupe model—one of the most rapid selling enclosed cars ever marketed by Nash.

This Six 4-Door Special Sedan is built purposely to supply that vast waiting army of open car owners who have been prohibited from enclosed luxury purely because of price.

Now Nash offers the fine quality and the complete luxury these buyers insist upon and offers them at a price but little above the sum they have heretofore paid for their touring and roadster models.

The significance of this new Nash car is two-fold.

It lends new and greater value to the Nash dealer contract because it directly and emphatically increases their volume of business and the rapidity of their turn-over.

And secondly it illustrates the vigorous force and progressive spirit that energizes the manufacturing as well as the sales departments of the Nash Motors Company.

Nash dealers can rest confident that swiftly moving as automobile history is The Nash Motors Company will always be a leader in the development of practical, salable, profitable merchandise designed to focus even more firmly the attention of the public upon the name Nash and the product.

Features and Appointments of New Special Sedan—All-metal panel, 4-door body. Spacious comfort for five full-grown passengers. Upholstery of blue mohair cloth. Fine 7-jeweled clock. Tasseled silken curtains. Door pockets. Dome light. Heater. Foot rest. Automatic windshield wiper. Rear-vision mirror. Inbuilt sun visor. Kick plates. Three doors with locks on the inside and the fourth door locked from the outside. All windows adjustable save the rear plate.

(2502)

FOURS

The Nash Motors Company, Kenosha, Wis.

SIXES

The Cole Master Model Clutch is another Cole Engineering Triumph.



TRUE to Cole traditions of giving the public the benefit of advanced engineering at the lowest possible cost commensurate with fine car quality — the new Cole clutch is a masterpiece of engineering.

Its remarkable ease of engagement, its ability to transmit to the rear axle the smooth flow of power from the famous Cole V-Type eight cylinder motor

—and its self-adjusting and constructional features have won for it the highest praise from Cole owner and dealer alike.

The Cole clutch is only one of the important Cole features for 1924.

It was Cole who **FIRST** introduced **BALLOON TIRES** as regular and optional equipment.

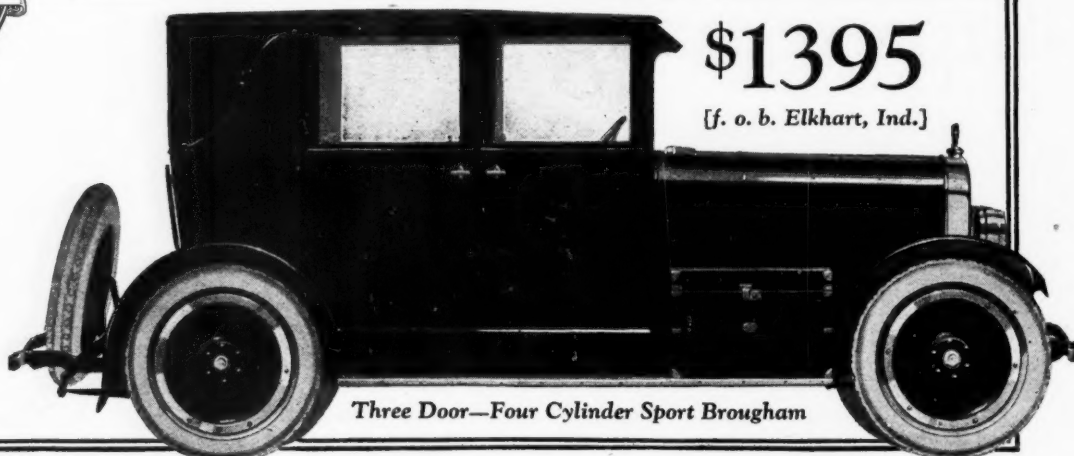
*See the new
Cole Clutch
at the New
York Auto
Show Jan. 5-12*

COLE MOTOR CAR COMPANY

Indianapolis, U.S.A.

COLE

THERE'S A TOUCH OF TOMORROW IN ALL COLE DOES TODAY



\$1395

[f. o. b. Elkhart, Ind.]

Three Door—Four Cylinder Sport Brougham

A new field for the dealer in high-priced cars

It is rapidly becoming the custom for owners of big, expensive cars to have smaller, less costly cars as auxiliaries for occasions where big cars are not needed. Since the greater growth of this custom is due to feminine demands and a desire for economy, many of these auxiliary cars are ELCARS. Their beautiful lines and superb coachwork satisfy the most exacting where appearance is concerned, and their uniformly low maintenance cost makes a booster of every owner.

It is logical that ELCARS as auxiliaries can best be sold by dealers in cars of price. Letters for agency details from such dealers will receive prompt and full replies, or a visit to the ELCAR Booth at the Show will secure equally full information.

At The New York Show—BOOTH 51

SIXES
Continental Motored
Closed and
Open Models

ELCAR

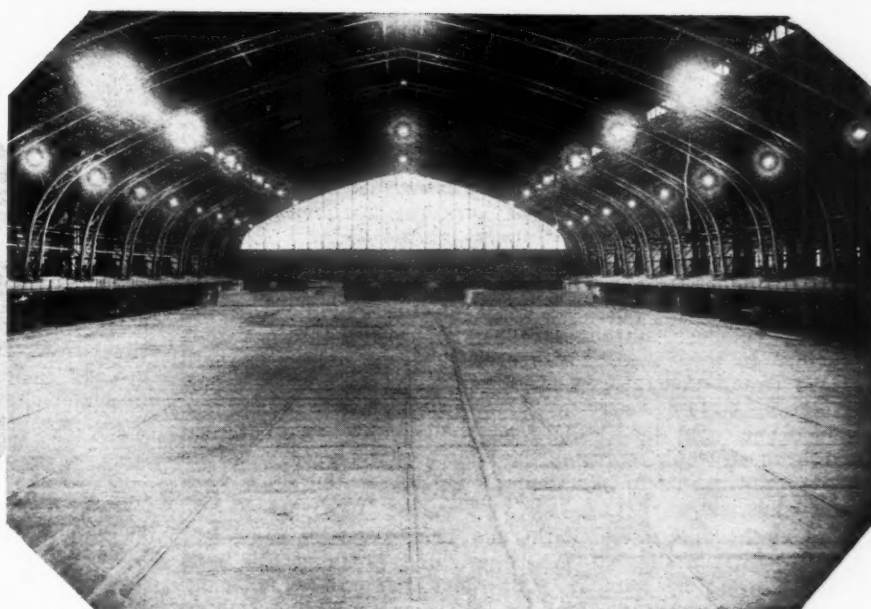
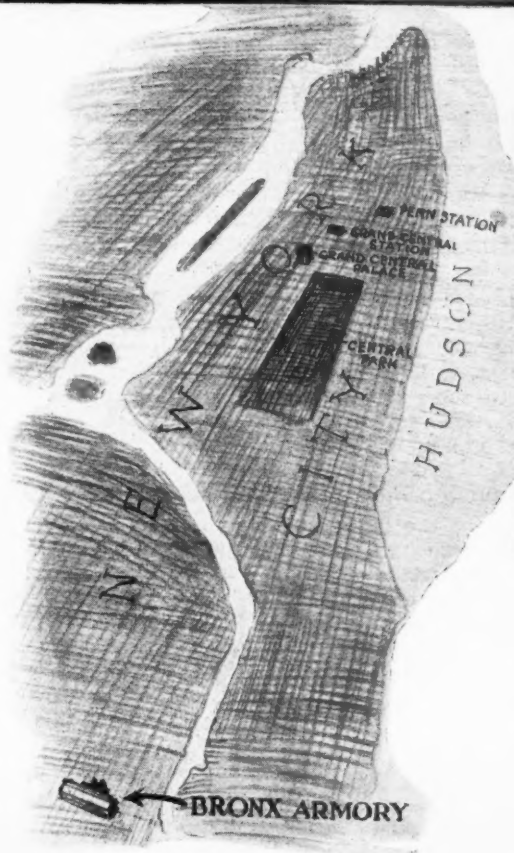
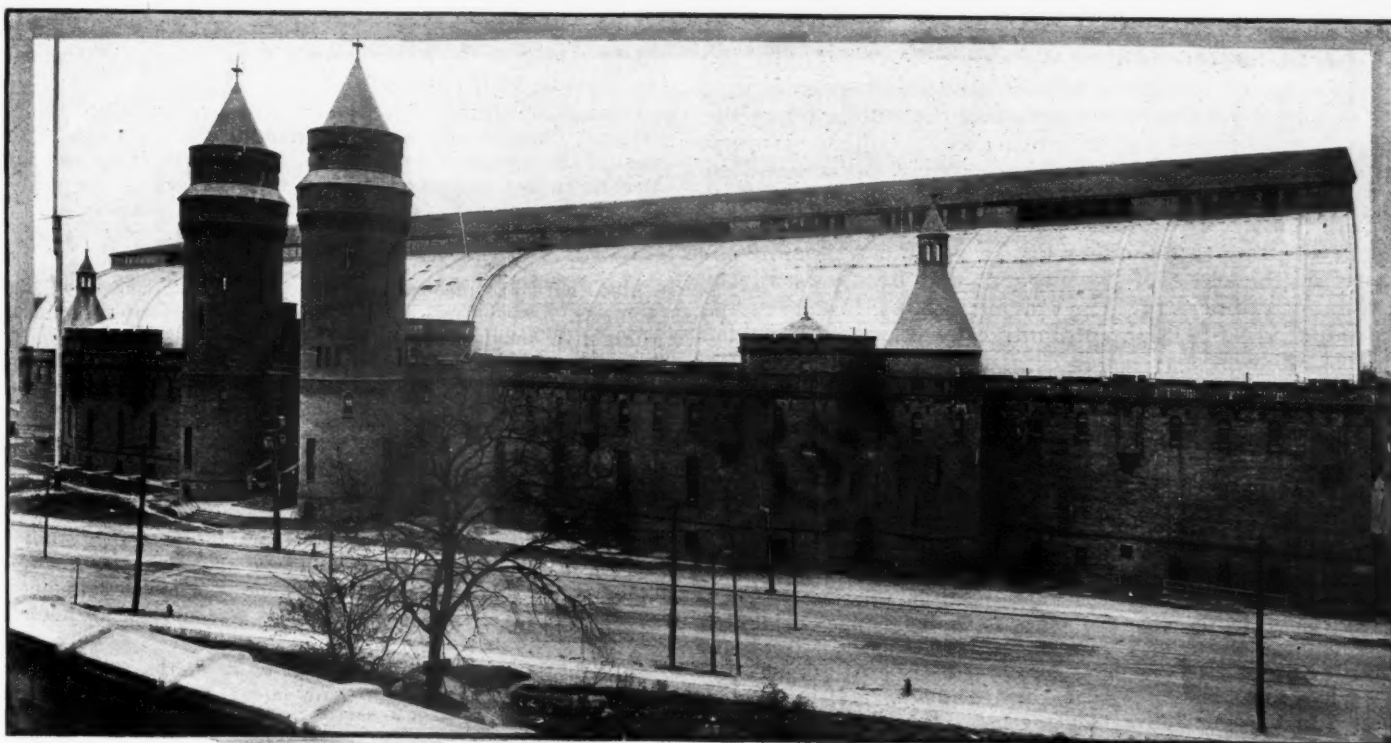
FOURS
Lycoming Motored
Closed and
Open Models

A WELL BUILT CAR

ELCAR MOTOR COMPANY, Elkhart, Indiana

Builders of Fine Vehicles Since 1873

MOTOR AGE



The Twenty-fourth Annual New York Automobile Show will open Saturday in the new 256th Field Artillery Armory. This, the greatest of all automobile shows, marks the close of the greatest year in the history of the automotive industry

The Premier of Motor Car Shows Will Open 1924 Season in New York Saturday

Twenty-fourth Annual Exhibition and Gathering of the Clans of the Industry Promises to Be Notable. Biggest Exhibition Ever Staged Under One Roof. Many Events Scheduled for Week

By CLYDE JENNINGS

THE largest enclosed floor space ever occupied for a motor car show will house the finest exhibit of passenger cars ever shown to the public when the doors are opened to the 256th Field Artillery Armory, next Saturday. This will be the official opening of the 1924 show season and the Twenty-fourth annual New York Show.

It is fitting that this greatest of all shows should come just at the close of the biggest and best year of the automotive industry. The year just gone into the records produced 4,014,000 automotive vehicles, of which 3,644,000 were passenger cars.

These figures have confounded economists and statisticians who early in the year attempted to plot the course of the industry for 1923 and so it is entirely within the bounds of things as they should be, that the 1924 show season should mark a new era in exhibitions.

In order to accommodate this exhibit and make it the show that the industry has always visualized, it was necessary to take the exhibition from the congested portion of New York to a site some distance from those parts familiar to the average visitor to the city and place it in the newest exhibition building in the city, where an open floor space 300 by 600 feet had been made available for an artillery drill ground.

When this building was in construction several men interested in the automotive industry happened to pass and stood in the entrance and looked into the vastness of the building. After looking into what seemed interminable space for a few minutes, they turned to each other and exclaimed:

"What an automobile show building this would make!"

Where the Show Will Be Held

And it has come about that this building is to be so used as a climax of the biggest year in the industry. Although considerable distance from the usual show spaces, the building is within the scope of the New York rapid transit facilities and the subway delivers passengers at the door.

In this marvelous building more than 300 cars will be displayed on one floor with plenty of aisle space and there is every assurance that the doors of this building will not have to be closed in the face of the crowds three or four evenings in the week, as has been the case in recent years at the Grand Central Palace. The handicaps of the former exhibition building were well known. Because four floors were occupied by the exhibits, strict fire rules were enforced and on most evenings during the middle of the week hundreds of visitors anxious to pay their money to see the show were denied admission.

One distinct advantage of the new location of the show will be the seats in the balcony, where one can rest and still see the great spectacular main floor. It has been many years since the visitor to a New York show could do anything but walk and walk and walk, except those who were bold enough to pretend to be prospects and rest in a car when some salesman kindly opened the door and invited them to enter.

An additional advantage of the new site is that it is near the popular motor car driveway of the Bronx district and parking space can be provided for 3,000 cars.

The New York Show has always been the most notable show in the country and it differs from the Chicago show

chiefly that it is the occasion of a more general gathering of the captains of the industry.

During the New York show there are meetings of the National Chamber of Commerce committees to an extent that most of the manufacturers are called there for these meetings. Also there are dozens of meetings of dealers of the eastern part of the country, fostered by the factory officials.

Important Meetings Planned

Also there are meetings of the Motor and Accessory Manufacturers Association, a very important body of men in the automotive scheme, and The Rubber Association of America. These three national organizations each hold annual dinners during the show period and these mark the high points of social activities.

A change in the program is made this year because the Society of Automotive Engineers has decided to hold the annual meeting of that society at Detroit, at a later date. It was found during past years that the engineers who gathered there during the show were more interested in studying the actual products in the exhibitions than in attending professional meetings. As the attendance was never satisfactory at anything except social meetings, it was decided to hold the sessions elsewhere.

On another page of this issue is a list of the 75 car manufacturers who will exhibit their latest models on the great floor space. Also the 300 makers of parts and accessories who will have space around the main floor and in the balcony.

The photographs of this great building which are reproduced on the title page of this issue really give a false impression of the size of the structure, because there is no basis of comparison. A better impression of the interior photograph can be gained if one will note how small the balcony appears.

One of the advantages of the larger building is the additional space allotted to each exhibitor for his use. Each space in the Armory is 25 per cent larger than in the Grand Central Palace last year.

There has been a feeling during the last few months that the shows of this year would lack interest because of the early announcement of the 1924 models. However, as the time draws near, it is seen that despite the announcements already made by some large producers who have the facilities in dealer show rooms for placing their cars before the public, there is much of interest left for the shows.

Announcements by Manufacturers

Just on the eve of the shows we have a number of announcements, some of which have been made public through descriptions and dealer showings of cars and others, the descriptions of which are being withheld until the show or a later date. Among these cars are Essex, Gray, Rollin, Moon, Templar, Velie, Elgin, Stutz, and the Chrysler. Also the different models of four wheel brakes and their application are going to be of intense interest to those who know motor cars and it is predicted that there will be some surprises along this line.

Of the cars that were in the show last year and which do not appear this year are Rotary Six, Climber, Hatfield, Courier, Crawford, Detroit Electric, Handley, King, Mercer, Milburn Electric, Mitchell, Noma, Patterson, Sayers, Stanley, and Winton.

An addition to the usual exhibits is the taxi-cab display. In former shows taxi-cabs were not admitted as such because it was held that they were commercial vehicles. Now it has been decided that they are sold by dealers and should be permitted in the display space. The taxi-cab exhibitors are Checker, Dodge, Premier, Rauch & Lang, Reo, Pennant, Willys-Overland and Yellow Cab.

In discussing the matter of interest of an automobile show, too often the objective of the show is entirely lost sight of. This great show that is to be staged in New York and later repeated in Chicago, is not primarily for the automobile sharps; the makers, distributors and dealers but is primarily to keep alive the interest of the people of the country in the automobile and those things which go with it.

Public Interest the Real Objective

This show could be an entire success if there was no gathering of the people in the industry at the same time and if not a single thing was shown that would arouse the interest of the engineers, provided that at the show there were those things that interest the public. And it might be added that to a very great extent, the public pays the bills for the exhibition.

Always it must be remembered that the professional interest at an automobile show is considerable of a by-product.

While some announcements of new prices are being made on the eve of the show, there is little expectancy of a great number of changes. For the last three shows the visitors have gone there with the price question uppermost in their minds. This year, it will be a considerable surprise if radical price announcements are made during the show.

More likely there is apt to be some price advances, based chiefly perhaps on optional equipment, such as four wheel brakes, balloon tires and innovations of this kind.

The New York and Chicago shows are given under the direction of the National Automobile Chamber of Commerce and Sam Miles, who was the original show manager in Chicago at which time he was publisher of *MOTOR AGE*, has been manager of these two shows for a number of years. These are the only shows at which cars are exhibited by the manufacturers. All other shows are under the auspices of the dealers of the community where the show is given.

There always has been a feeling that the New York show

answers the question as to how successful the other shows will be—as representing the interest of the public in the automotive products of the year.

Manager Miles is doing his utmost to bring the public to the New York show and the advertising of the show, always well done, is being made a very special job this year in an effort to get the public to ignore the change of location and attend as in former years. It is, of course, a considerable job to jolt a great number of people out of old habits.

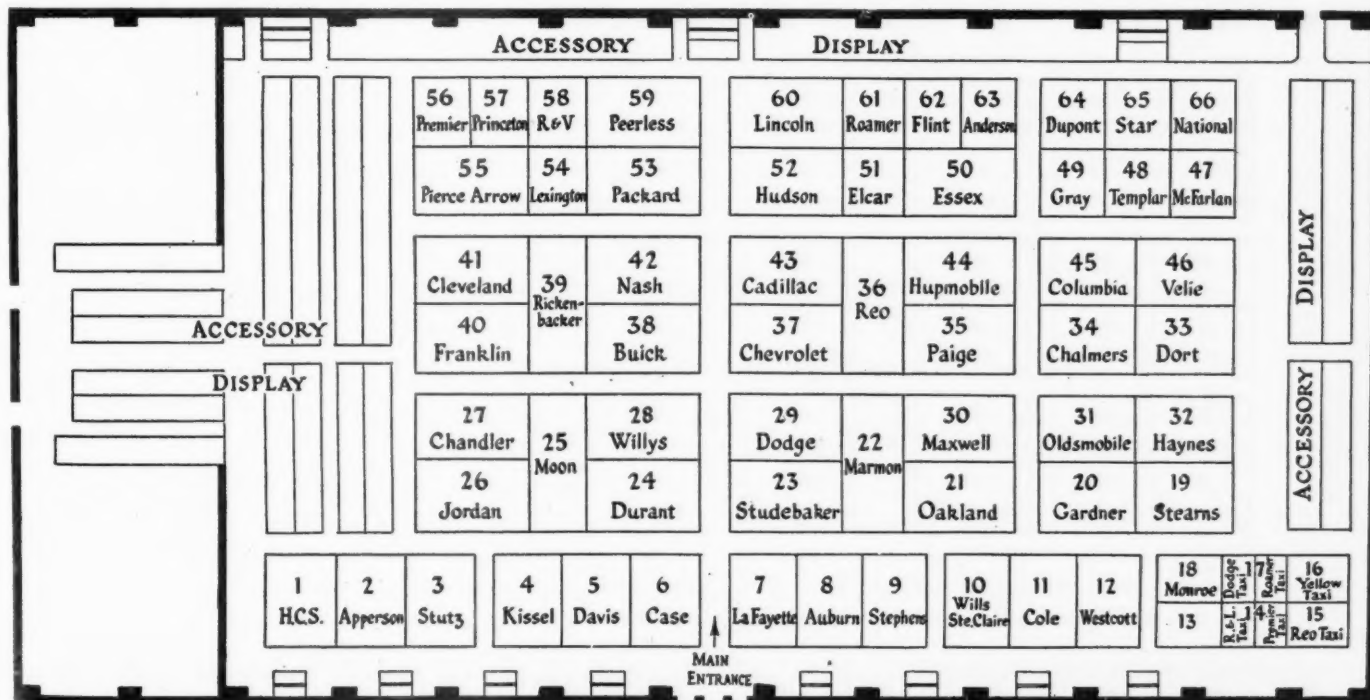
In addition to the daily paper publicity, Miles has enlisted the co-operation of the hotels and department stores. On each hotel menu there will be a card telling of the show, with instructions how to get to the Armory from that particular hotel, while each of the big department stores will have window exhibits of an automobile nature and showing automobile show placards. Subway platforms, street cars and busses all will carry show advertising, and if Father Knickerbocker doesn't know what is going on it will not be the fault of Miles or his energetic publicity director, E. F. Korbel.

Having set the attendance trap in this manner, Manager Miles is now engaged in preparing the Armory for the show itself—a gigantic task in comparison with previous years because of the size of the drill hall and the fact that the roof is 120 ft. from the floor.

As planned, the main figure in each of the eighty-four architectural courts will be the "Goddess of Transportation," for which Miss Catherine Joy Moore was chosen as a model. Enormous paintings, symbolizing the contrast between the most ancient and the modern forms of transportation, will cover the ends of the great drill hall, while the fourteen steel trusses will be inclosed at their bases. In the balcony the paneling around the trusses will become part of the wall booths, each space resembling the interior of a handsome show room.

The drill hall floor will be covered with terra cotta colored linoleum, which will greatly facilitate the nightly cleaning of the hall. It will require sixty tons of this linoleum to cover the drill hall floor.

In contrast to previous New York shows there will be a restaurant large enough to accommodate not only the exhibitors but the public as well. This will be handled by Harry Stevens, the caterer, who expects to keep twelve cooks and sixty waiters busy.



Floor plan of the 256th Field Artillery Armory showing the location of car exhibits at the New York Show. Equipment exhibits will have the spaces around the walls and at the left of the main hall

Car and Equipment Manufacturers Exhibition at the National Shows

The 75 Cars and Taxicabs listed below will be exhibited at the New York and Chicago Shows as indicated in the columns at the right.

Make	Name	N. Y.	Chi.	Name	N. Y.	Chi.	
American	American Motor Corp. of N. J., Plainfield, N. J.	x	x	McFarlan	McFarlan Motor Corp., Connersville, Ind.	x	x
Anderson	Anderson Motor Co., Rock Hill, S. C.	x	x	Marmon	Nordyke & Marmon Co., Pontiac, Mich.	x	x
Apperson	Apperson Bros. Auto Co., Kokomo, Ind.	x	x	Maxwell	Maxwell Motor Sales Corp., Detroit	x	x
Auburn	Auburn Auto Co., Auburn, Ind.	x	x	Moon	Moon Motor Car Co., St. Louis	x	x
Barley	Roamer Motor Car Co., Kalamazoo, Mich.	x	x	Nash	Nash Motors Co., Kenosha, Wis.	x	x
Buick	Buick Motor Co., Flint, Mich.	x	x	Oakland	Oakland Motor Car Co., Pontiac, Mich.	x	x
Cadillac	Cadillac Motor Car Co., Detroit	x	x	Oldsmobile	Olds Motor Works, Lansing, Mich.	x	x
Case	J. I. Case T. M. Co., Racine, Wis.	x	x	Overland	Willys-Overland, Inc., Toledo, Ohio	x	x
Chalmers	Chalmers Motor Car Co., Detroit	x	x	Packard	Packard Motor Car Co., Detroit	x	x
Chandler	Chandler Motor Car Co., Cleveland	x	x	Paige	Paige-Detroit Motor Car Co., Detroit	x	x
Chevrolet	Chevrolet Motor Co., Detroit	x	x	Peerless	Peerless Motor Car Co., Cleveland	x	x
Cleveland	Cleveland Auto Co., Cleveland	x	x	Pierce-Arrow	Pierce-Arrow Motor Car Co., Buffalo, N. Y.	x	x
Cole	Cole Motor Car Co., Indianapolis	x	x	Pilot	Pilot Motor Car Co., Richmond, Ind.	x	x
Collins	Peerless Motor Car Co., Cleveland	x	x	Premier	Premier Motors, Inc., Indianapolis	x	x
Columbia	Columbia Motors Co., Detroit	x	x	R. & V.	R. & V. Motor Co., East Moline, Ill.	x	x
Davis	Davis Motor Car Co., Geo. W., Richmond, Ind.	x	x	Reo	Reo Motor Car Co., Lansing, Mich.	x	x
Dodge	Dodge Brothers, Detroit	x	x	Rickenbacker	Rickenbacker Motor Co., Detroit	x	x
Dort	Dort Motor Car Co., Flint	x	x	Roamer	Roamer Motor Car Co., Kalamazoo, Mich.	x	x
du Pont	du Pont Motors, Inc., Moore, Pa.	x	x	Star	Star Motor Co., New York City	x	x
Durant	Durant Motors, Inc., Long Island City, N. Y.	x	x	Stearns	F. B. Stearns Co., Cleveland	x	x
Elcar	Elcar Motor Co., Elkhart, Ind.	x	x	Stephens	Stephens Motor Car Co., Inc., Moline, Ill.	x	x
Elgin	Elgin Motors, Inc., Indianapolis	x	x	Studebaker	Studebaker Corp. of America, South Bend, Ind.	x	x
Essex	Essex Motors, Detroit	x	x	Stutz	Stutz Motor Car Co. of America, Inc., Indianapolis	x	x
Flint	Locomobile Co. of America, New York City	x	x	Templar	Templar Motors Co., Cleveland	x	x
Franklin	H. H. Franklin Mfg. Co., Syracuse, N. Y.	x	x	Vellie	Vellie Motors Corp., Moline, Ill.	x	x
Gardner	Gardner Motor Co., Inc., St. Louis	x	x	Westcott	Westcott Motor Car Co., Springfield, O.	x	x
Gray	Gray Motor Corp., Detroit	x	x	Wills Sainte Claire	Wills Sainte Claire, Inc., Marysville, Mich.	x	x
H. C. S.	H. C. S. Motor Car Co., Indianapolis	x	x	Willys-Knight	Willys-Overland, Inc., Toledo, Ohio	x	x
Haynes	Haynes Auto Co., Kokomo, Ind.	x	x	Checker	Checker Cab Mfg. Corp., Kalamazoo, Mich.	x	x
Hudson	Hudson Motor Car Co., Detroit	x	x	Dodge	Dodge Brothers, Detroit	x	x
Hupmobile	Hupp Motor Car Corp., Detroit	x	x	Premier	Premier Motors, Inc., Indianapolis	x	x
Jewett	Paige-Detroit Motor Car Co., Detroit	x	x	Rauch & Lang	Rauch & Lang, Inc., Chicopee Falls, Mass.	x	x
Jordan	Jordan Motor Car Co., Inc., Cleveland	x	x	Reo	Reo Motor Car Co., Lansing, Mich.	x	x
Kissel	Kissel Motor Car Co., Hartford, Wis.	x	x	Pennant	Roamer Motor Car Co., Kalamazoo, Mich.	x	x
LaFayette	LaFayette Motors Corp., Milwaukee	x	x	Willys-Overland	Willys-Overland, Inc., Toledo, Ohio	x	x
Lexington	Lexington Motor Co., Connersville, Ind.	x	x	Yellow Cab	Yellow Cab Mfg. Co., Chicago	x	x
Liberty	Columbia Motors Co., Detroit	x	x				
Lincoln	Lincoln Motor Co., Detroit	x	x				

Equipment Manufacturers will exhibit at the New York and Chicago Shows as indicated in the columns at the right.

Name and Address	N. Y.	Chi.	Name and Address	N. Y.	Chi.	Name and Address	N. Y.	Chi.
A-C Brake Co. of N. Y., New York City	x		Bayern & Co., M. L., New York City	x		Columbia Axle Co., Cleveland	x	x
A. C. Spark Plug Co., Flint, Mich.	x	x	Becker Bros., Inc., Chicago	x	x	Continental Motors Corp., Detroit	x	x
All Clear Windshields, Inc., Fall River, Mass.	x	x	Beneke & Kropf Mfg. Co., Chicago	x	x	Cord Tire Corp., Pittsburgh	x	x
Allyne-Zerk Co., Detroit	x	x	Benzer Corp., Brooklyn, N. Y.	x	x	Cuno Engineering Corp., Meriden, Conn.	x	x
Aluminum Co. of America, Pittsburgh	x	x	Berg Auto Trunk & Specialty Co., Inc., Long Island City, N. Y.	x	x	Dalton & Balch, Inc., Chicago	x	x
American Air Stand Mfg. Corp., Jersey Shore, Pa.	x		Bilflex Corp., Waukegan, Ill.	x	x	Dayton Steel Foundry Co., Dayton, Ohio	x	x
American Auto Lamp Co., Inc., New York City	x	x	Bilrite Motor Equipment Co., Inc., New York City	x	x	Detroit Motor Casting Co., Detroit	x	
American Automatic Devices Co., Chicago	x	x	Borg & Beck Co., Chicago	x	x	Dewey, Martin A., Jr., New York City	x	
American Automobile Association, New York City	x	x	Bosch Magneto Co., Inc., Robert, New York City	x	x	Diamond State Fibre Co., Bridgeport, Pa.	x	x
American Chain Co., Inc., Bridgeport, Conn.	x	x	Boyle Valve Co., Chicago	x	x	Dickinson & Co., Inc., Minneapolis, Minn.	x	x
American Federal Wheel Co., Milwaukee	x	x	Bridgeport Chain Co., Bridgeport, Conn.	x		Doehler Die Casting Co., Brooklyn, N. Y.	x	x
American Hammered Piston Ring Co., Baltimore, Md.	x		Britton Auto Products Co., Inc., New York City	x	x	Dunhamer Corp., Chicago	x	x
American Oil Pump & Tank Co., Cincinnati	x		Brown-Lipe Gear Co., Syracuse, N. Y.	x	x	Duro-Brite Co., care of Marshall Metal Corp., Chicago	x	
American Taximeter Co., New York City	x		Brude Co., T. M., Chicago	x	x	E. A. Laboratories, Inc., Brooklyn, N. Y.	x	
Appleton Electric Co., New York City	x	x	Buda Co., Harvey, Ill.	x	x	Eagle-Ottawa Leather Co., Grand Haven, Mich.	x	x
Arkay Sales Co., New York City	x	x	Budd Mfg. Co., Edward G., Philadelphia, Pa.	x		Eastern Tube & Tool Co., Brooklyn, N. Y.	x	
Arrow Grip Mfg. Co., Glens Falls, N. Y.	x	x	Budd Wheel Co., Philadelphia, Pa.	x	x	Eaton Axle & Spring Co., Cleveland	x	x
Asch & Co., Inc., New York City	x	x	Buffalo Specialty Co., Buffalo, N. Y.	x	x	Eberhard Mfg. Co., Cleveland	x	x
Auto Bed Camp Mfg. Co., New York City	x		Rule Chemical Corp., Edward R., New York City	x	x	Eclipse Machine Co., Elmira, N. Y.	x	x
Autocoil Co., Jersey City, N. J.	x	x	Bullet Proof & Non Shatterable Glass Corp., New York City	x	x	Electron Metal Corp. of America, New York City	x	
Autohoist Products Co., Inc., New York City	x		Bunting Brass & Bronze Co., Toledo, Ohio	x	x	Elk Machine Tool Corp., New York City	x	
Auto-Hone Co., Inc., Buffalo, N. Y.	x	x	Butler Kwik-Lift Co., Inc., Brooklyn, N. Y.	x	x	Ensign Carburetor Co., Chicago	x	x
Auto Pedal Pad Co., Inc., New York City	x		Byrne, Kingston & Co., Kokomo, Ind.	x	x	Fabric Body Corp., Detroit	x	x
Auto Specialties Mfg. Co., St. Joseph, Mich.	x	x	C. G. Spring Co., Detroit	x	x	Farans, William M., New York City	x	
Bahr & Co., Alton E., Chicago	x		Carr Fastener Co., Cambridge, Mass.	x	x	Fitzgerald Mfg. Co., Torrington, Conn.	x	x
Barnes Foundry Co., New York City	x		Carter Co., George R., Connersville, Ind.	x	x	Flash Sales Corp., Chicago	x	
Bary Axle Corp., Syracuse, N. Y.	x		Champion Pneumatic Machinery Co., Chicago	x	x	Flentje, Ernst, Cambridge, Mass.	x	x
Bassick Mfg. Co., Chicago	x	x	Cincinnati Ball Crank Co., Cincinnati	x	x	Folberth Auto Specialty Co., Cleveland	x	x
Baush Machine Tool Co., Springfield, Mass.	x		Clark Equipment Co., Buchanan, Mich.	x	x	Foster-Johnson Reamer Co., Elkhart, Ind.	x	x
			Cleveland Hardware Co., Cleveland	x		Frick Bros., Brooklyn, N. Y.	x	
						Fulton Co., Knoxville, Tenn.	x	

Name and Address	N. Y.	Chi.	Name and Address	N. Y.	Chi.	Name and Address	N. Y.	Chi.
Fulton Co., Milwaukee	x	x	Marcus Co., Robert,	x		Shakeproof Lock Washer Co.,	x	x
G-H Tension Ring Co.,			New York City			Chicago		
Baltimore, Md.	x		Marshall Metal Corp., Chicago	x	x	Simplex Windshield Wing Co.,		x
Gabriel Mfg. Co., Cleveland	x	x	McAdams Co., J. C.,	x	x	Chicago		
Gasco Mfg. Co., Lancaster, Pa.	x		New York City			Simplicity Engine & Mfg. Co.,		x
Gemco Mfg. Co., Milwaukee	x		McClellan Mfg. Co., H. A.,	x	x	Port Washington, Wis.	x	x
General Asbestos & Rubber Co.,			New London, Conn.	x	x	Snap-On Wrench Co., Chicago	x	x
Charleston, S. C.	x		McClellan Co., S. S.,	x	x	South Bend Lathe Wks.,		
General Electric Co.,			New York City	x	x	South Bend, Ind.		x
Schenectady, N. Y.	x	x	McClure Electrically Operated	x		Speed-O Multiple Valve Lifter		
Gisholt Machine Co., Madison, Wis.	x	x	Oil Cups, New York City	x		Corp., New York City	x	
Gits Bros. Mfg. Co., Chicago	x		Merchant & Evans Co.,	x		Spiro Mfg. Co., New York City	x	
Globe Mfg. Co.,			Philadelphia	x		Staff Bros. Co., New York City	x	
Battle Creek, Mich.	x		Metal Stamping Co., Inc.,			Stafford, Inc., S. S.,		
H. A. D. Sales & Engineering Co.,			Long Island City, N. Y.	x	x	New York City	x	x
Bronson, Mich.	x		Miller Products Corp.,			Steel Products Co., Cleveland	x	x
Halladay Co., L. P., Decatur, Ill.	x	x	Paterson, N. J.	x		Stewart-Warner Speedometer		
Hall Cylinder Hone Co.,			Mirrolite Mfg. Co., Inc.,			Corp., Chicago	x	x
Toledo	x	x	Long Island City, N. Y.	x		Stover Signal Engineering Co.,		
Hartford, Inc., Edward V.,			Monarch Bumper Mfg. Co.,	x	x	Racine, Wis.	x	x
Jersey City, N. J.	x	x	Detroit	x		Stringer Cable Brake Co.,		
Hartford Battery Mfg. Co.,			Morrin, Stephen V.,	x		Pottstown, Pa.	x	
Milldale, Conn.	x	x	New York City	x		Stromberg Motor Devices Co.,		
Hassler, Inc., Robert H.,			Motive Parts Corp.,	x		Chicago	x	x
Indianapolis	x	x	New York City			Sun Oil Co., Philadelphia	x	
Hayes Wheel Co.,			Moto-Meter Co., Inc.,	x		Superior Lamp Mfg. Co.,		
Jackson, Mich.	x	x	Long Island City, N. Y.	x	x	New York City	x	
Heintz Mfg. Co., Philadelphia	x		Motor Car Supplies Co., Inc.,	x		Super-Shock Absorber Co.,		
Hercules Motors Corp.,			New York City	x		Jersey City, N. J.	x	
Canton, Ohio	x	x	Motor Craft Engineering Corp.,	x		Taylor Trunk Wks., C. A.,		
Hoe Corp.,			New York City	x		Chicago	x	x
Poughkeepsie, N. Y.	x		Motor Toggery, Inc.,	x		Titeflex Metal Hose Co.,		
Holmes Co., Ernest,			Buffalo, N. Y.	x		Newark, N. J.	x	
Chattanooga, Tenn.	x	x	Murphy Varnish Co.,	x		Tonneau Shield Co., Inc.,		
Hoof Co., John C.,			Newark, N. J.	x	x	New York City	x	x
Chicago	x	x	Nacto Cleaner Corp.,	x		Trans-Continental Freight Co.,		
Houdaille Co., Buffalo, N. Y.	x	x	New York City	x		New York City	x	
Houptert Machine Co.,			Naperville Machine Co., Inc.,	x		Trico Products Corp.,		
Long Island City, N. Y.	x		Naperville, Ill.	x		Buffalo, N. Y.	x	x
Igo Vertical Bumper Co.,			National Lead Co.,	x		Triple Action Spring Co. of N. Y.,		
Harrisburg, Pa.	x	x	New York City	x		Inc., New York City	x	
Imperial Brass Mfg. Co., Chicago	x	x	National Lead Battery Co.,	x		Turner Mfg. Co., Kokomo, Ind.	x	x
Imperial Utilities Co.,			St. Paul, Minn.	x	x	United Autoware, Inc.,		
Paterson, N. J.	x		Never-Break Products Co., Inc.,	x		New York City	x	
Indian Motorcycle Co.,			Bangor, Pa.	x		U. S. Asbestos Co., Manheim, Pa.	x	
Springfield, Mass.	x		New Era Spring & Specialty Co.,	x		U. S. Auto Lamp Mfg. Co.,		
Indiana Piston Ring Co.,			Grand Rapids, Mich.	x		New York City	x	x
Hagerstown, Md.	x		New York Wire & Spring Co.,	x	x	U. S. Axle Co., Pottstown, Pa.	x	x
Jassen Wind Deflector Co.,			Hoboken, N. J.	x	x	U. S. Bureau of Public Roads,		
Brooklyn, N. Y.	x		Nolenz, Inc., New York City	x	x	Washington, D. C.	x	x
Jenkins Vulcan Spring Co.,			Oakes Co., Indianapolis	x	x	U. S. Chain & Forging Co.,		
Richmond, Ind.	x	x	Pantasote Co., New York City	x	x	Pittsburg	x	x
Jonas, C. N. & F. W., Chicago	x	x	Panyard Machine & Mfg. Co.,	x		U. S. E. Corp., New York City	x	
K. P. Products Co., Inc.,			Detroit	x		Vacuum Oil Co., New York City	x	x
New York City	x		Panyard Piston Ring Co. of Ill.,			Vortex Carbureter Co., Inc.,		
K-W Glareshield Co. of Mass.,			Chicago	x		Boston		x
Inc., Boston	x	x	Perfection Gear Co., Chicago	x		W. B. Mfg. Co., New York City	x	
K-W Ignition Co., Cleveland	x	x	Perfection Heater & Mfg. Co.,	x		Waco Co., Harrisburg, Pa.	x	
K & W. Rubber Co.,			Cleveland	x	x	Wall Pump & Compressor Co.,		
Delaware, Ohio	x	x	Perkins, Campbell Co., Cincinnati	x	x	Quincy, Ill.		x
Kay Bee Mfg. Co., Los Angeles	x		Petroleum Motors Corp.,	x		Waltham Watch Co.,		
Kokomo Electric Co.,			Rockford, Ill.	x	x	Waltham, Mass.	x	x
Laduna Products Corp.,			Philbrin Corp.,			Watson Co., John Warren,		
New York City	x		Kennett Square, Pa.	x		Philadelphia	x	x
Lake Sales Co., New York City	x		Pines Mfg. Co., Chicago	x	x	Waukesha Motor Co.,		
La-Lo Chemical Co.,			Polygon Products Co., Boston	x	x	Waukesha, Wis.	x	x
Providence, R. I.	x		Pratt Mfg. Co., Wm. E.,	x		Weaver Mfg. Co., Springfield, Ill.	x	x
Lanton Auto Equipment Co.,			Chicago	x	x	Weldo Rubber Co.,		
Inc., New York City	x	x	Preferred Utilities Co.,	x		Brooklyn, N. Y.	x	
Lee Strauss Company,			New York City	x		Wel-Ever Piston Ring Co.,		
Johnstown, Pa.	x		Prest-Air Corp.,			Toledo, Ohio	x	x
Levett Co., Walker M.,			Long Island City, N. Y.	x	x	Weston Electrical Instrument Co.,		
New York City	x		Protexall Co., Abingdon, Ill.	x	x	Newark, N. J.	x	
Light Mfg. & Foundry Co.,			Pyrene Mfg. Co., Newark, N. J.	x		Wheeler-Schebler Carbureter Co.,		
Pottstown, Pa.	x		Rajah Auto Supply Co.,			Indianapolis	x	x
Limousine Body Co.,			Bloomfield, N. J.	x	x	Whiteland Mfg. Corp.,		
Kalamazoo, Mich.	x		Rajo Motor Co., Racine, Wis.	x		Long Island City, N. Y.	x	
Link-Belt Co., Indianapolis	x		Reus Mfg. Co., Baltimore, Md.	x	x	Wilson, K. R., Buffalo, N. Y.	x	x
Lomar Mfg. Co.,			Rex Mfg. Co., Connersville, Ind.	x	x	Wilson & Co., Thos. E., Chicago	x	x
Middletown, Ohio	x		Ross Gear & Tool Co.,			Wire Wheel Corp. of America,		
Lorraine Corp., Chicago	x	x	Lafayette, Ind.	x	x	Buffalo, N. Y.	x	x
Lovejoy Mfg. Co., Boston	x	x	Sachsenmaier Co., George,	x		Witherow Steel Co., Pittsburg	x	x
Lyngaas Co., Chas. F.,			Philadelphia	x	x	Wolverine Bumper & Specialty Co.,		
New York City	x		Sage Air Systems, Inc.,	x		Grand Rapids, Mich.	x	x
Manley Mfg. Co., York, Pa.	x		New York City	x	x	Wyman-Gordon Co.,		
Manzel Bros. Co.,			Schrader's Sons, Inc., A.,	x		Worcester, Mass.	x	
Buffalo, N. Y.	x		Brooklyn, N. Y.	x	x	Y. M. C. A., New York City	x	
						Yellow Jack-It Mfg. Co., Chicago	x	x

DAV'S DIARY

JAN 3.—Gee here it is 1924 and i aint no better off than i was 2 years ago almost except i am making more money but i cant save no more than i could then on account of having so many more places to spend it having a girl to take to the movies and some times her foulks and ice cream sodas to buy and if i had a fliver like Arts to buy gas and oil for it i gess i would be in the hoal most of the time. I gess art would be worse off than me except he aint got no girl and all he spends is what it costs for board and to run his fliver and as it is he saves

about 10 bucks a weak wich is better than i can do and me getting more money than him to boot.

Gosh i gess its about time for me to turn over a new leaf and save some money or when me and Art goes in bizness together it will be Art in the offs and me doing the dirty work.

If i was to save 10 bucks a weak like Art that would be 520 bucks in a year or 1040 for the both of us not counting the interest wich would be quite a bit. I aint counted the cost of them things up but i bet it would be pretty near enough to start an alley shop with a bunch of good tools and equipment so as we could do crackerjack work.

They aint no chanct of getting a raise this time of year when a guy is liable to get laid off most any minit and then where would your savings go but gee if a guy is going to save he can save just as well on small pay as on big and i am going to start the new year saving 10 bucks a week like Art.

I do solumly sware that i dan will deposit in the bank on pay day ten and no/100 dollars (\$10.00) or more if i can spare it same not to be withdrawn till needed to start in bizness.

Gee i aint finished paying for my girls present yet but them birds can wait a little while longer they got plenty of dough. If i dont get this started i mightnt ever.

Bement Drive a Simple Gearless Differential

Affords the Advantages of a Positive Drive and Yet Has Compensating Action When Needed. All Parts Are Drop Forged Steel With Surfaces Hardened

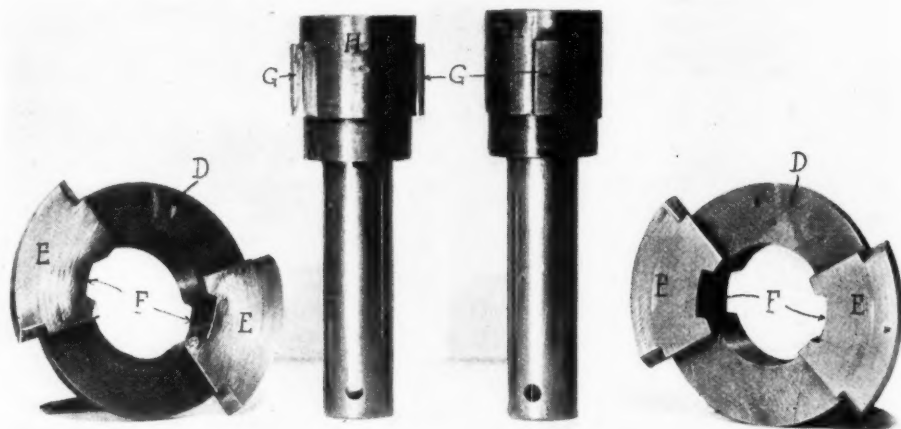
EMBODYING essentially all the features of a positive-drive differential and yet affording compensating action when it is needed, the Bement positive drive differential built by the Winnebago Tractor Co., Dixon, Ill., incorporates several original features.

The differential or Bement Drive as it is known to the trade, consists of only five parts, exclusive of two tensions springs which ordinarily are used to keep the two clutch pieces against the spider plate. There are no gears, pawls or ratchets and, inasmuch as all the parts are made of drop forged steel, long life is assured. In fact, the Bement Drive has been used successfully in the Winnebago Chief tractor for over 4 years, but it is only recently that the company has decided to extend its use to motor cars and trucks.

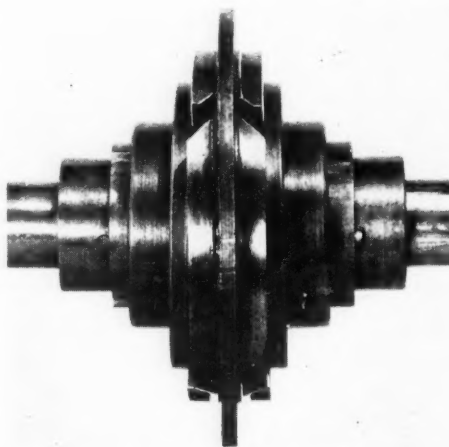
The illustrations used in this description show the drive as it is made for Fords. It is basically the same, however, as that made for other makes of motor vehicles.

Reference to the illustrations shows a spider plate A on which are mounted the two cam pieces B. The ends of these cams are cut to a 45 deg. angle and slightly rounded. It will be noted that there are two cams on each side of the spider. Each pair of cams is held together by rivets, but the cams are not fastened to the spider permanently. The arrangement is such that they can slide in circular openings cut in the spider. There are four driving lugs or dogs on the spider, indicated by C, and which are slightly below the surfaces of the cams B.

The clutch pieces D, although shown in the illustration with two keyways F, in production are made with four broached openings to take a four-spline slide H attached to the end of the axle



Here is shown the spider of the Bement Drive. The cams are riveted together in pairs and slide in circular slots



Partly assembled view of the Bement Drive.

shafts. The clutch pieces also are provided with two lugs E each, and, as will

be seen in the illustration, are bevelled at an angle of 45 deg. over a certain portion of their surface to correspond with the bevel on the cams.

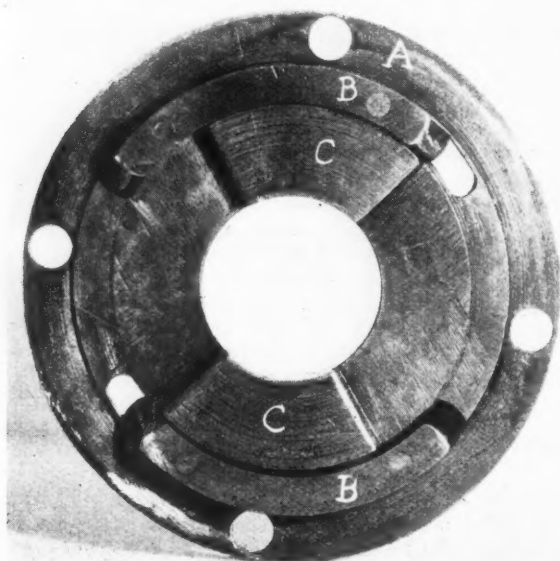
In assembling the drive the pieces H are keyed to the ends of the axle shafts, clutches D slipped over the slides H and the spider inserted between them so the lugs C come between lugs E. Before the housing is slipped into place a coil spring, of large diameter and exerting a pressure of 16 lbs. in the case of the differential for Fords, is placed against the pieces D and sides of the housing. This keeps the lugs in the position mentioned above.

It will be seen that, when the load is applied on the spider, such as driving the vehicle forward, the lugs C will drive the lugs E and therefore drive both axle shafts. Now should one wheel over run the driving member, as in turning a corner, the lugs E on the clutch pieces will slip out of engagement with the lugs C because of the cams. Lugs E will then ride the tops of the cams and not the surfaces of lugs C, because as mentioned before the cam pieces are slightly higher than the lugs C. The springs serve to force the clutches in place again.

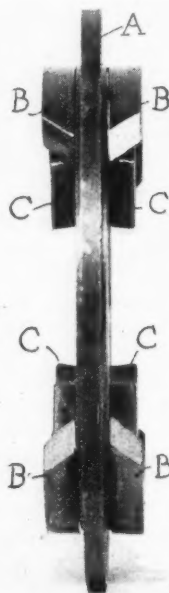
In going down a hill, should there be a tendency for the wheels to turn faster than the spider driving them, the lugs E on the clutches work together and in their travel forward, push the cams ahead instead of riding them, thus bringing the driving surfaces of the lugs into contact alternately. This action takes place until the spider again acts as the driving member.

With the Bement drive it is stated that a vehicle easily can pull out of a mud hole, because regardless of which wheel may be mired, it will be possible to move the car because the wheel having traction can be driven. It also is stated that skidding of the car is practically eliminated on slippery road surfaces.

All the wearing parts of the differential are hardened and the mechanism operates in oil.



The clutches and clutch slides used in the Bement Drive. The slides are keyed to the ends of the axle shafts



Pierce-Arrow Four Wheel Brakes of Internal Expanding Type

Steel Drums Finished All Over and Provided With Cooling Ribs. Front and Rear Brakes Both Operated by Foot Pedal. Operating Mechanism Simple

AFTER four years of experimental work Pierce-Arrow announces the adoption of four-wheel brakes based upon a principle used with success for thirteen years by a prominent European automobile manufacturer.

The front and rear wheel brakes are of the internal expanding aluminum shoe type, neatly and adequately enclosed, yet made so as to easily reach all parts. The shoes are lined with asbestos facing, which engages with steel drums finished all over and provided with cooling ribs. The rear brakes are $15\frac{1}{8}$ in. in diameter and $2\frac{3}{4}$ in. wide. The front brakes are 14 in. in diameter and $2\frac{1}{4}$ in. wide.

The ribs on the drums afford a large cooling surface and as braking is a conversion of energy into heat, this heat must be dissipated as quickly as possible.

Any expansion of the steel drums because of heat is followed up by expansion of the aluminum brake shoes. Due to the difference in expansion of the metal in the shoes and of the drum, there is no lost pedal travel and good braking is assured on the longest grades at all times, it is said.

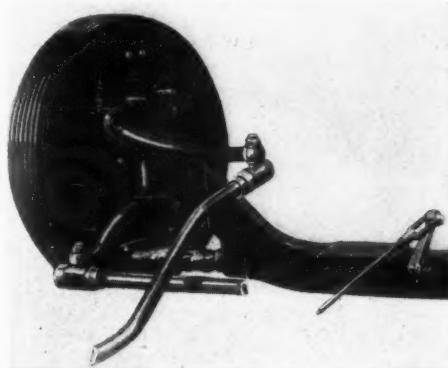
When the cam shafts are pulled back by the brake pedal rods, a rotary motion is imparted from the cams to the cam blocks. The cam blocks are squared on the sides but have curved surfaces on top and bottom. When the cam blocks are caused to rotate by the action of the cams, the curved surfaces of the cam blocks are brought into contact with the heels on the brake shoes, spreading them apart and against the drums.

Front and rear wheel brakes are both actuated by the foot pedal, the hand brake lever actuating the rear wheel brakes only. The brakes are operated through levers, rods, and an equalizing arrangement. Means for easy adjustment are provided.

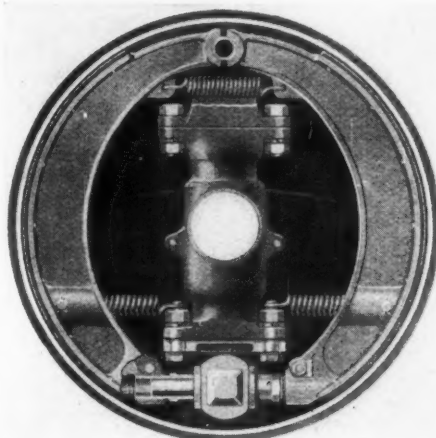
The entire front axle, springs, and steering arrangement have been designed to allow liberal factors of safety for all the carrying and brake torque loads. The front axle is of the Pierce-Arrow design of Elliott type.

The knuckles and pivot pins are so designed as to give the best steering effect. The vertical loads are carried on ball bearings located at the top of the steering knuckle. Clearances are adjustable with proper locking facilities.

The front wheel brake shoes are of the split hinge type, hinged at the top and actuated by the cam blocks located at the bottom, both points being supported from the steering knuckles. The cam blocks are actuated by cam shafts engaging in square holes in the cam blocks and so



Layout of the Pierce-Arrow front wheel brake, showing the operating lever in the I-beam of the axle



Details of the brake shoe mechanism of the Pierce-Arrow front wheel brake. The brake shoes are of aluminum

located that the center of the cams coincide with the center of the pivot pins. With this design, application of brakes does not affect the steering and steering does not affect the brakes under any condition.

The action of the brake mechanism is simple and positive. Depressing the brake pedal actuates a rod linked to front equalizer which in turn pulls back on the right and left levers attached to cam shafts, these shafts being mounted in bearings in front axle.

The cam block engages the faces of the brake shoes which are provided with hardened steel plates to resist wear. An easy and simple adjustment is provided at each shoe, that is, the front and rear shoe of each pair may be adjusted independently of the other. This allows for correct adjustment and application of each shoe to the brake drum.

This whole arrangement is neatly enclosed by aluminum plates, which can be easily removed for inspection and adjustment. Interference of the brakes by water, snow, mud, etc., is guarded against and eliminated. All the working surfaces are lubricated and the necessary points are provided with nipples for a pressure feed gun. The cam ends and cam blocks are made hard to resist wear and are packed in grease.

The rear wheel brakes are of the internal expanding shoe type, similar to those used on the front and provided in former models.

New Ross Gear of the Cam and Lever Type

THE tendency of most car owners to run their tires under-inflated, the gradual trend toward balloon tires, and the increased difficulties of parking, have concentrated attention on the need for improved steering equipment. Along with this increased activity The Ross Gear and Tool Company of Lafayette, Ind., has produced a steering gear known as the Ross cam and lever type.

The design of this gear is entirely different from anything heretofore made, and is said to offer steering advantages which entirely offset the added strain put on drivers by low inflation or balloon tires.

The two unique features in the design are its variable ratio and long leverage. The variable ratio of the cam affords a slow-acting gear in mid or driving position, which increases constantly toward either extreme. The result is that with

straight ahead driving the low reduction in mid-position practically eliminates all road shock. When rounding a right-angle corner the ratio constantly increases so that only a very slight turning of the wheel is required.

The other unique feature, the long actuating lever which lessens friction and affords ease of operation.

The actuating member is a cam, similar in appearance to a single thread screw of variable pitch, mounted between ball-bearings which take both thrust and radial load. These ball-bearings eliminate the necessity of annular bronze bushings and eliminate friction to a large extent.

The cam is connected by a serrated spline joint with the steering tube at the upper end of which the steering wheel is attached. When the steering wheel is turned, the cam turns in its bearings.



The new Ross cam and lever type steering gear designed especially for balloon tire equipment.

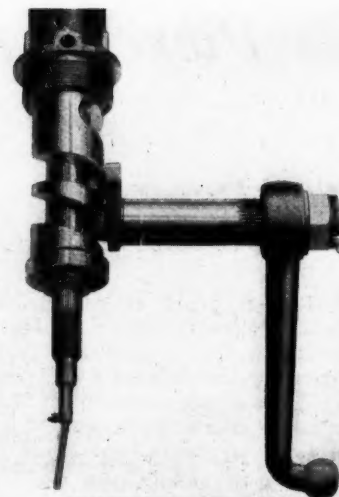
The stud, projecting from the inner side of the lever and in contact with the cam, moves up or down. This rotates the lever which is integral with the trunnion shaft and in turn rotates the steering arm.

The steering arm is attached to the outer end of the trunnion shaft by a 36-tooth, V-type, serrated spline. Owing to the long lever and the elimination of friction, the mechanical efficiency is said to be higher than that of old style steering gears.

In mid-position there is a slight pitch to the thread of the cam and the motion is slow, but as the pitch increases, the motion increases constantly toward either extreme.

The long lever arm makes it possible to have low pressure on the contact surface of the cam and the projecting stud from the lever. The cam and trunnion shaft are both manufactured from low carbon steel, case-hardened. The cam-surface and the stud are hardened. The housing is split longitudinally, being assembled with shims to get the proper adjustment of the stud and the cam surface. A similar shim construction is provided for adjustment of the ball-bearings.

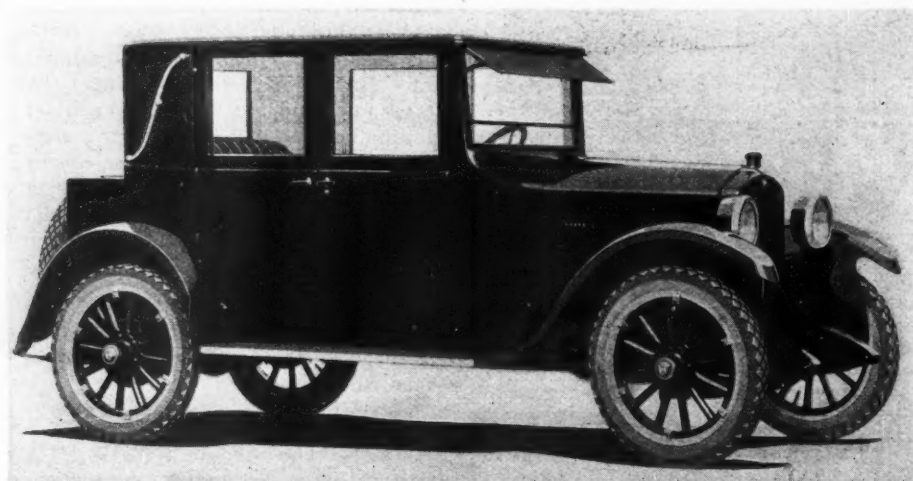
The steering gear is compact, small and light and is oil tight. Longitudinal



This shows the details of the cam and operating lever of the new Ross steering gear.

grooves on the sector tube and machined in the lower end of the housing, prevent the tube from rotating and hold the spark and throttle control set in stationary position when the steering wheel is turned. These grooves also prevent the oil from leaking out the bottom of the steering gear.

Club-Sedan Latest in Hupmobile Line



Hupmobile club sedan, a three-door construction and selling for \$1425

IN addition to the seven body types which were announced at the time of the revision of the chassis and power plant, the Hupp Motor Car Corporation is now bringing out an eighth that is designated as the club sedan. Five passengers are accommodated in the two-compartment, full width seats, three-door construction which is priced at \$1425.

A novel interior arrangement which utilizes the space under the rear of the front seat for foot-room for passengers in the rear compartment, results in a rather short body which allows for an unusually large trunk and the tire carrier at the rear with no overhang beyond the spring horns.

As the front seat board is six inches

above the floor boards and overhangs the seat pedestal by eight inches at the rear, much of the required foot room is produced in this manner and the result is a body which is somewhat shorter than customary. Consequently, the trunk is unusually large, the inside dimensions being approximately: length, 42½ in., width, 12 in. and average height, 15 in. As the trunk extends almost across the full width of the body, golf clubs and other long articles can be accommodated.

Doors are placed at both sides of the front compartment and at the curb or right side of the rear compartment. The body is widened at the rear to make ample space for three passengers in the rear seat. With the exception of the window in the rear panel, all windows

are provided with regulators. The interior of the body is upholstered in the same materials that are used in the standard sedan.

Accessory equipment includes a dome lamp, rear vision mirror, visor and windshield wiper. For the exterior, the hood, radiator shell and fenders are black baked enamel. The body is finished in blue paint up to the belt line. The rear quarters are covered with black leather fabric and carry diagonal aluminum bows. Leather fabric is used for the exterior covering of the soft top.

"Motor Fuels"

MOTOR Fuels, Their Production and Technology. By Eugene H. Leslie, Ph. D. Book department the Chemical Catalog Company, Inc., 19 East 24th St., New York.

The author stresses the importance of the fundamental conceptions underlying the operations used in the production of motor fuels. To acquire these essentials an accurate knowledge of physics, thermodynamics and chemistry is the basic requirement. The author presupposes at least an elementary knowledge of these subjects but, though largely technical, the chapters devoted to the general processes of distillation and possibilities of substitute fuels are readable by the non-engineer. The remaining chapters, of which there are 17, are written in the language of the chemist and mechanical engineer.

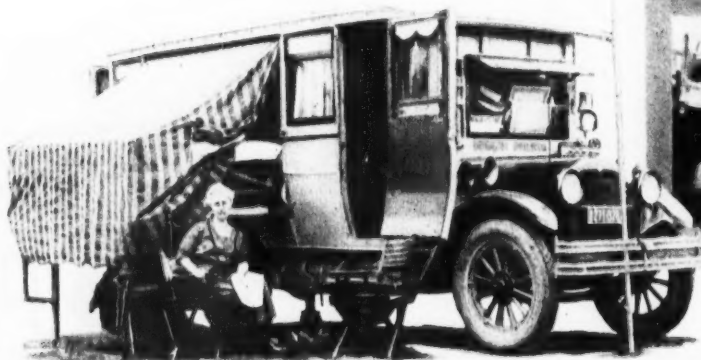
The technical chapters cover the principles of distillation, fluid flow, heat transfer, thermal reactions of hydrocarbons, and refining processes. The appendix contains numerous tables and figures regarding important statistical matter and engineering data.



The MARVELOUS
VERSATILITY
of the
MOTOR VEHICLE

*Do these pictures suggest a possibility of
additional sales in your community?*

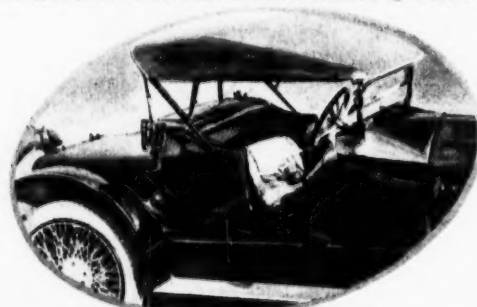
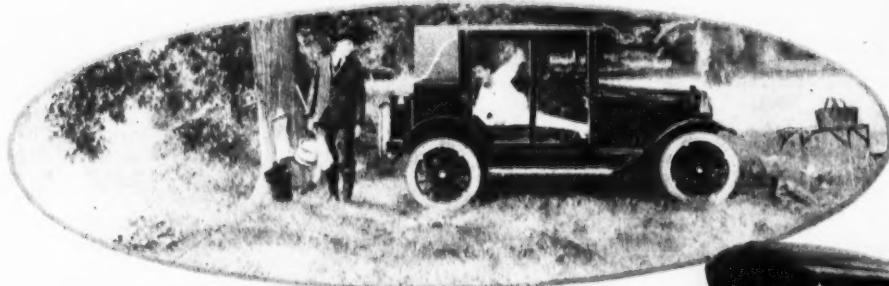
Health And Happiness Through The Modern Motor Caravan



The call of the wild has been answered by many people during the last few years in the way of equipping truck chassis with bodies suited to the needs of the camper. And, with the advent of radio, there is no such thing as complete isolation from the rest of the world for the motoring nomads



Not how many miles per gallon of fuel, but how many miles per goat skin of water is uppermost in the minds of the Persians who have to travel the salt desert of Shiraz



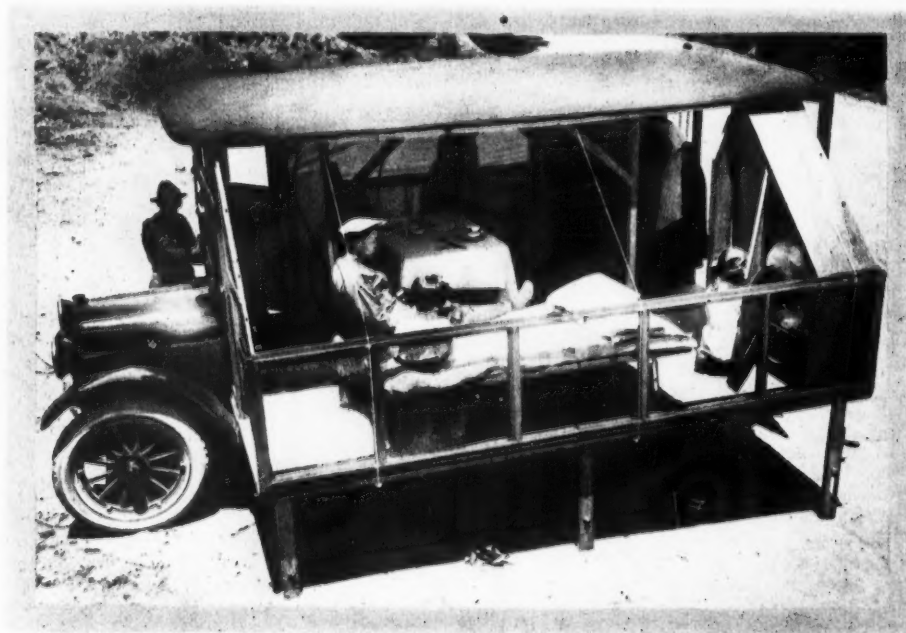
Pretty soft, says this salesman who, when he cannot make a town, simply curls up inside the car



Above is shown a typical gypsy car. It carries all the things necessary to approximate conditions in the home, including provisions for sleeping in the car. Below, one way to keep the doctor away—maybe we should say away from his work

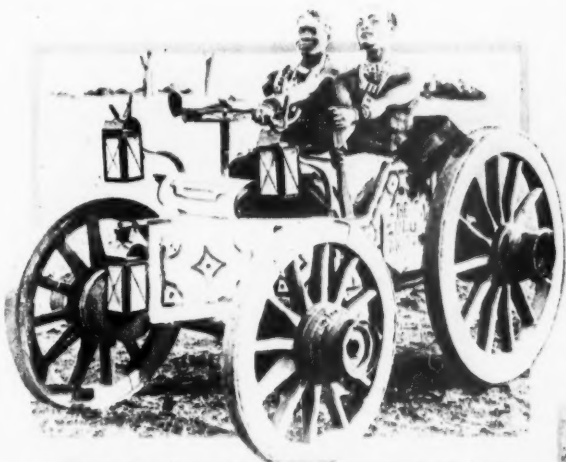


These people covered some 13,500 miles. Many of the trophies were collected in the interior of Washington and Oregon

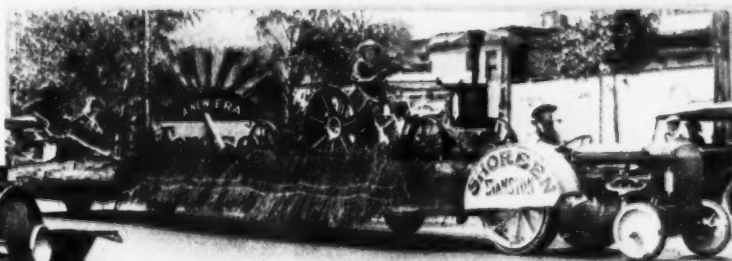


No need to look for a pump or creek, when you carry a supply of water on the camp trailer

The Motor Car A Go-Getter In Advertising



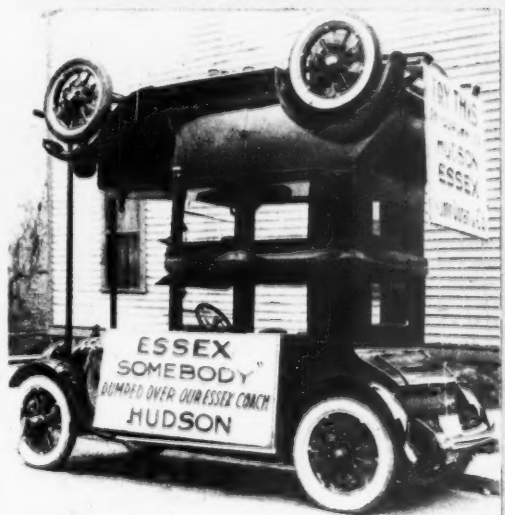
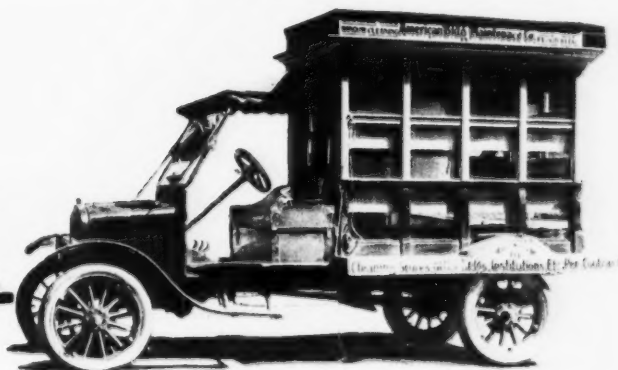
A Zulu chief and his bride starting on their honeymoon. May be a chance for balloon tires on this car



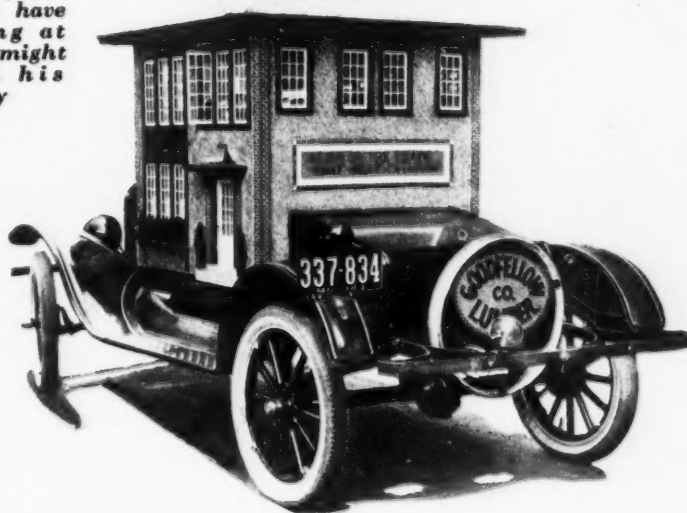
This group of pictures shows the advertising value of the motor vehicle. Anything to get away from the cut and dried methods



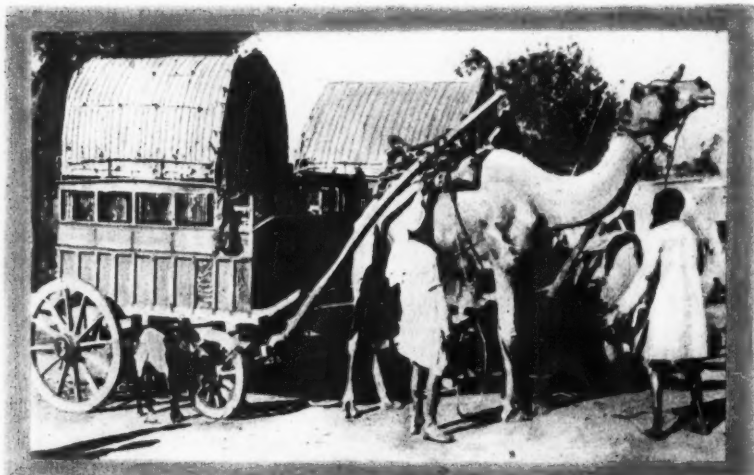
No, they're not sport models of locomotives. The innerds reveal strange likeness to a Henry



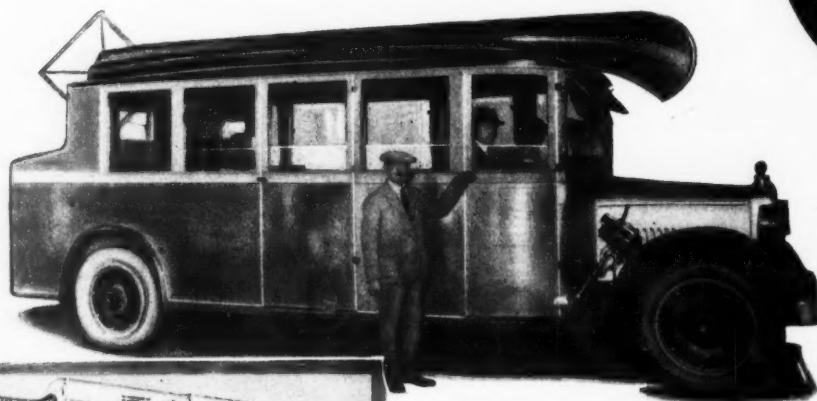
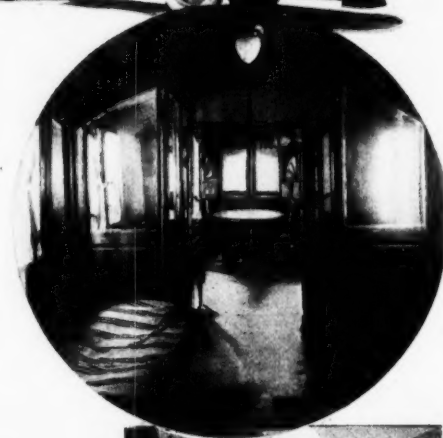
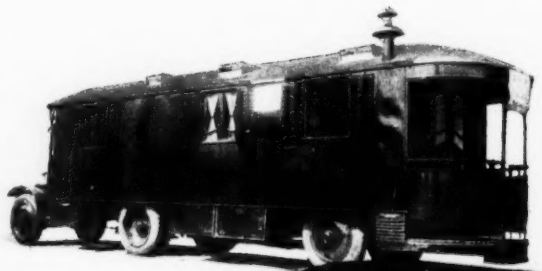
A sober man (what other kind have we?) looking at these stunts might question his sobriety



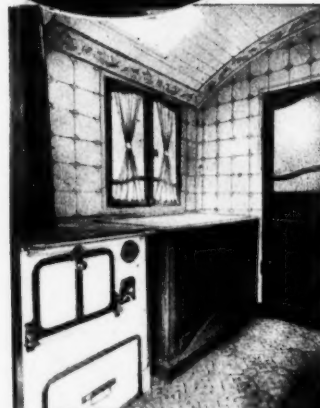
Carrying The Pullman Car Idea To The Motor Vehicle



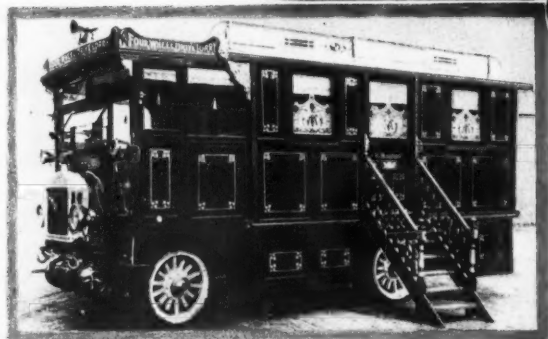
A prairie schooner in far off Arabia. This outfit never is bothered by such a thing as railroad administration



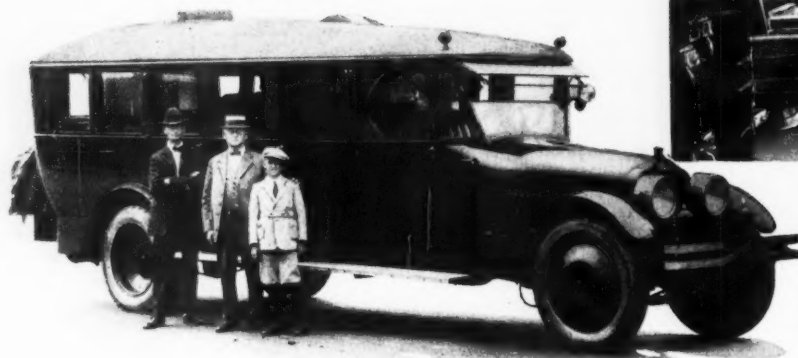
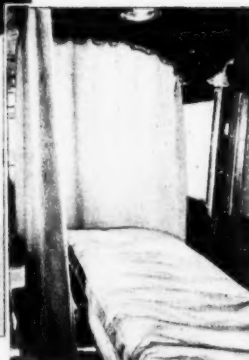
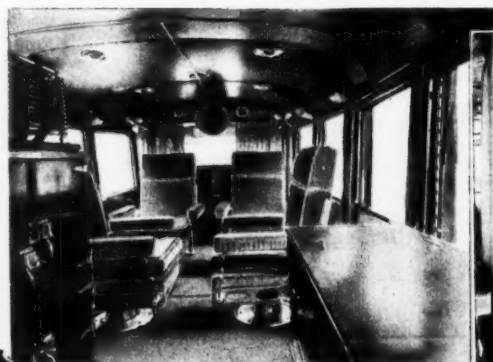
Above is shown a travelling home, complete to radio, the aerial for which is shown at the rear. Notice the canoe and outboard engine also carried



Look at this wandering home, mounted on six wheels. It was built in France and the chassis is a White. It is a three-room dwelling consisting of kitchen, dining room and bed room



An English showman's luxurious automobile home. Looks quite a bit like it might have been designed for the Chinese government



And here we have the automobile palace of W. K. Kellogg, well-known corn flake king. Imagine the solid comfort in the big, soft armchairs. And if you like you can take a nap in one of the berths while the car is reeling off the miles, that is, if you are not doing the driving

Bringing The Store On Wheels To You



In Belgium the motive power takes a rest while the selling force is framing a chicken dinner with a housewife



Actual demonstration is better for selling typewriters than the well-known route via the catalog, thinks the Paxton Typewriter Co., Bloomington, Ill.

This motor dispensary takes care of sick animals in London. It makes daily trips and the body of the truck has been built and equipped by the People's Dispensary for Sick Animals



Below is shown a kitchen on wheels. It is the manner chosen by one concern to demonstrate its equipment for the kitchen. Fine thing to watch when you're hungry and broke



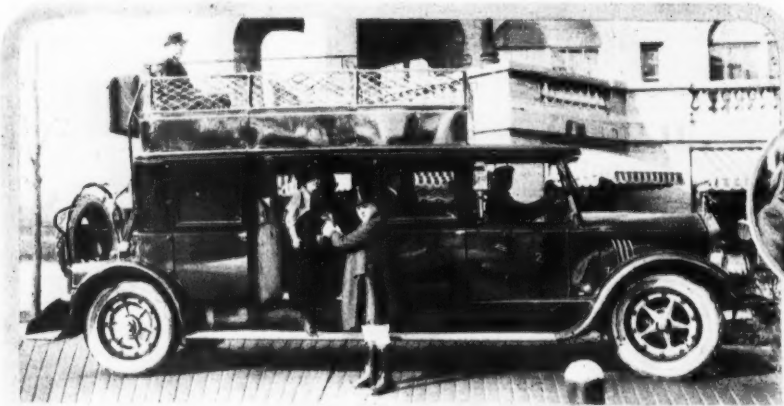
The corner grocery store has moved, is moving we should say. Here it is shown on wheels; stops right in front of your home. Confusion is avoided by entering the "store" at the rear and leaving at the front



Rolling fish market supplies fresh sea food to inland towns at low cost. The market is complete from display windows to a spacious store, electrically lighted

The salesman shown at the left worries little about getting his sample cases from one place to another. He does not have to slip the porters several half dollars a day and chuckles every time he shoves a case back into place

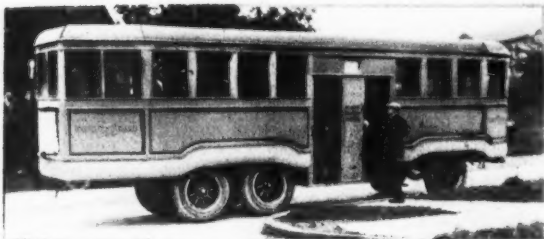
"Let's Take The Bus To-day, Instead Of The Train"



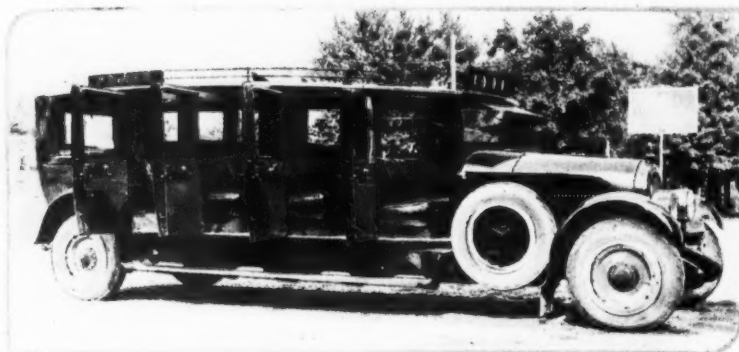
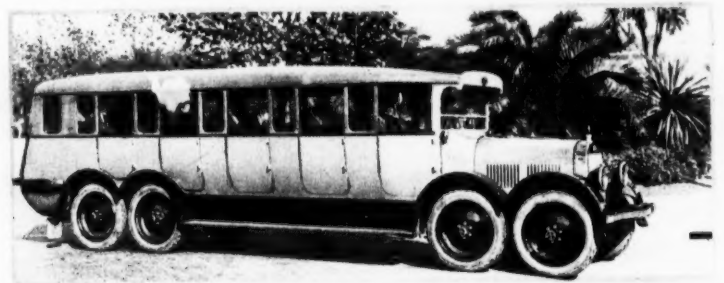
A type of bus operated by a fashionable hotel for its patrons



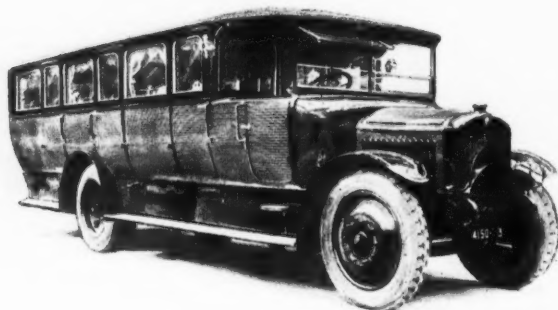
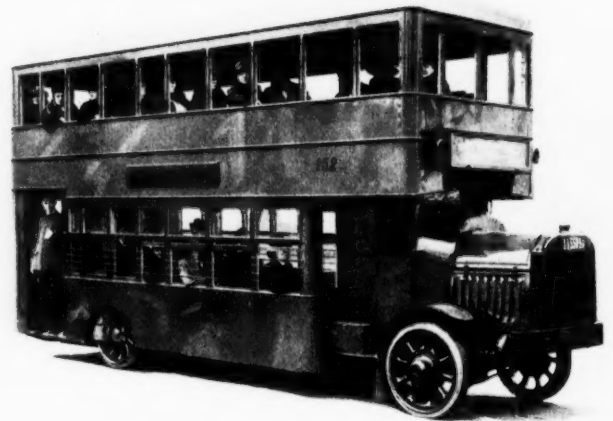
In India the bus consists of a transport like this



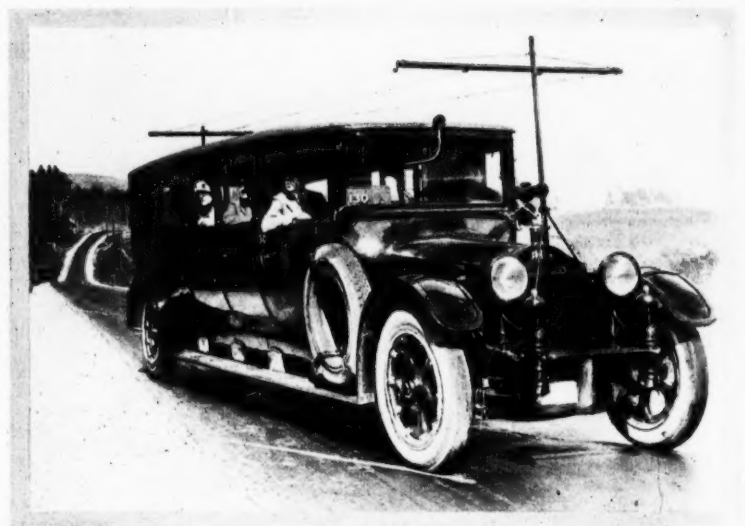
They keep stretching them out and putting more wheels under them



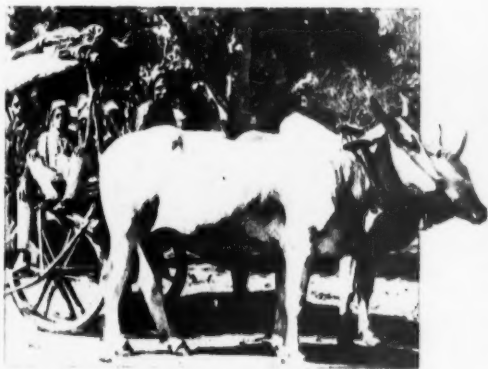
You can have side door, rear door, family entrances or anything else in the modern motor bus



This coach is for weddings and carries 24 people. It has all the necessary fitments excepting the parson, who must be supplied by the customers



The Tractor Will Do It Better And Much More Quickly



The sons and daughters of Delhi use the white oxen for getting them there and back. The driver looks worried about the strict speed law

"Farming is certainly hard work" might have been said a few years ago but farming in the modern way leaves enough time for the "hands" to take in a movie at night, especially since the horses don't have to be fed and bedded



"Let the tractor do the work" says the man on the left, who merely has to stand by for the most part and see that the logs are rolled into place

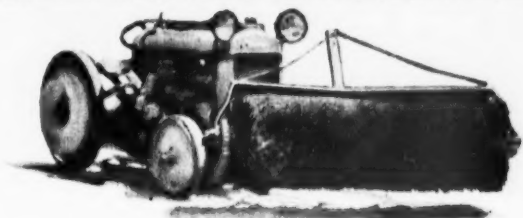


Tractors are not made to just plow up the ground. They come in very handy when there are buildings to be transplanted as shown by the procedure below

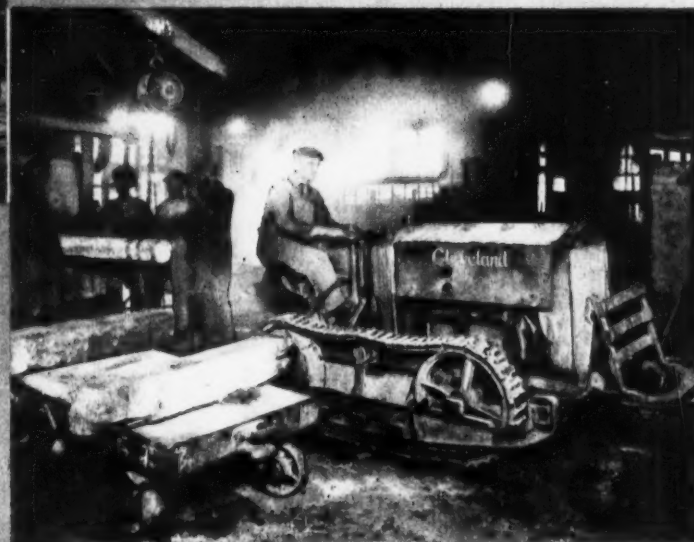


No danger of the tractor getting cold feet when it comes to pulling an ice cutting machine

Labor unions and so on don't bother the tractor in industry. It can work 24 hours a day and nobody says a word about overtime or unions



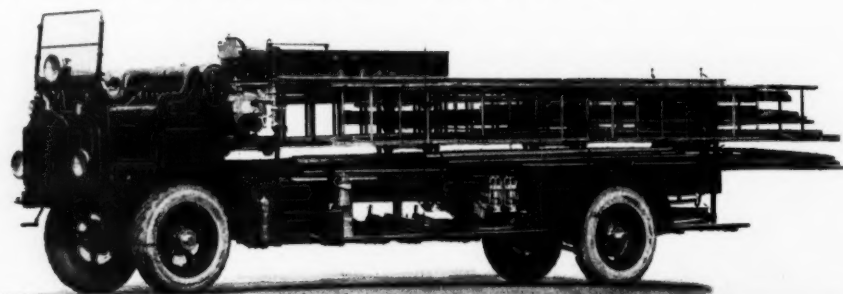
Does your town need a street sweeper? Here is the way one community rigged up an outfit to keep its city spick and span



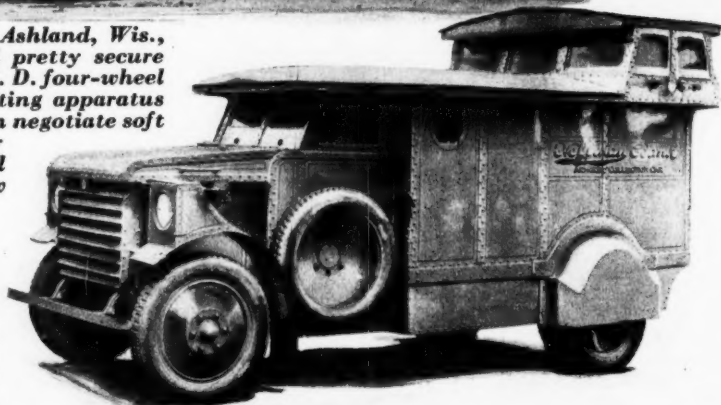
Motoring To The Fire, Jail And Bank



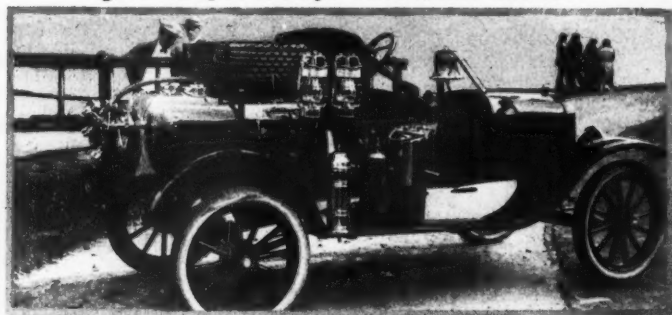
A counterbalanced crankshaft has no place in the makeup of this Chinese taxi, its balance depends upon the passengers. Maybe it's a fire truck, who knows



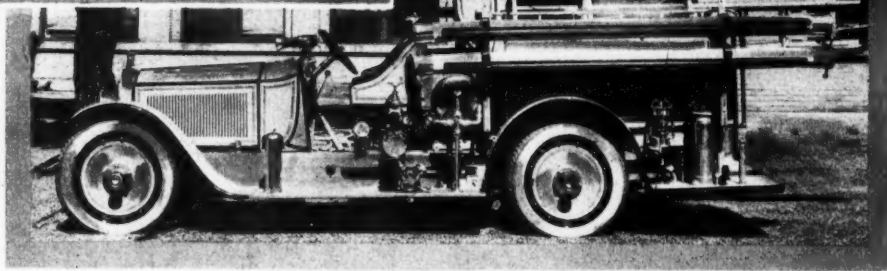
The town of Ashland, Wis., ought to feel pretty secure with the F. W. D. four-wheel drive fire fighting apparatus shown. It can negotiate soft and muddy roads as well as huge snow drifts



Outa luck, we should say to those who tried to break through the armor of this car used by a bank to transport its money

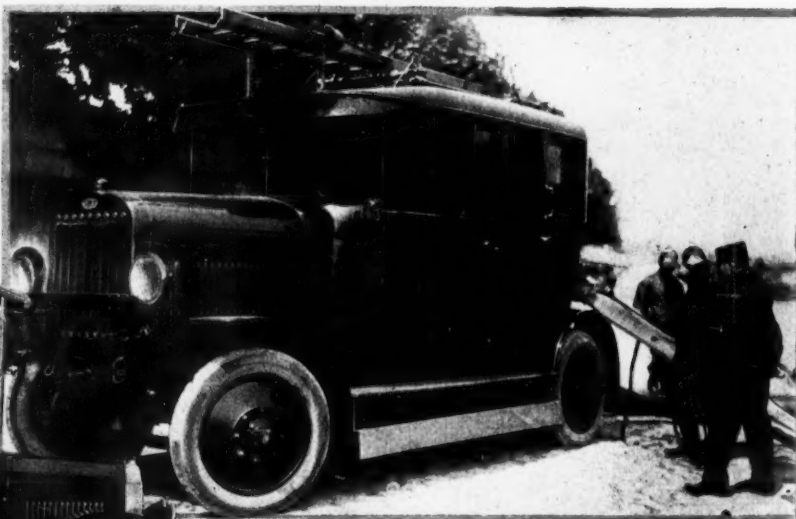


George Washington's home, Mt. Vernon, breathes easier. Henry Ford presented this Ford fire fighting truck to the town when he saw no fire fighting apparatus there



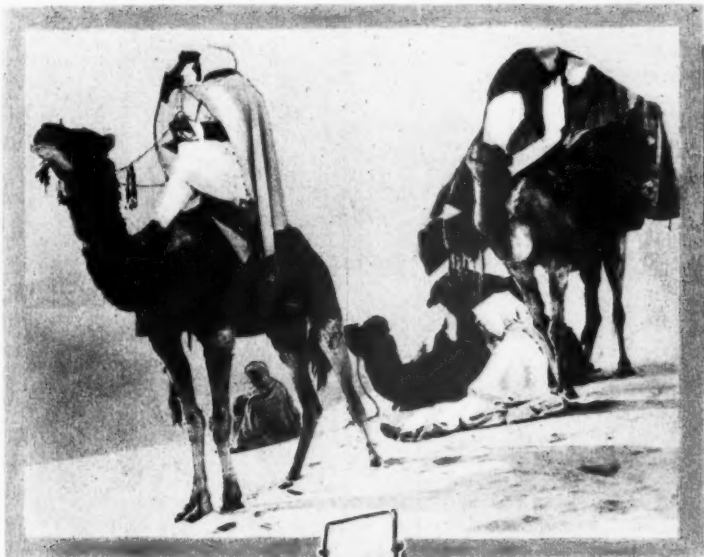
Do you wonder the fire insurance companies feel happy when they see a fire fighting truck like this one bought by a city? A case of get there quickly and everything to work with when you arrive

Perhaps after all it's not so bad to be a culprit in La Paz, Bolivia, when they may ride in this patrol built by an American concern



This Paris motor fire pump furnishes 300 cubic meters of water an hour and takes care of 24 lines of hose. Gee. What if it were connected up to a brewery in the old days

Dealers, Are These Suggestions For Customers?



This man brings his church right with him



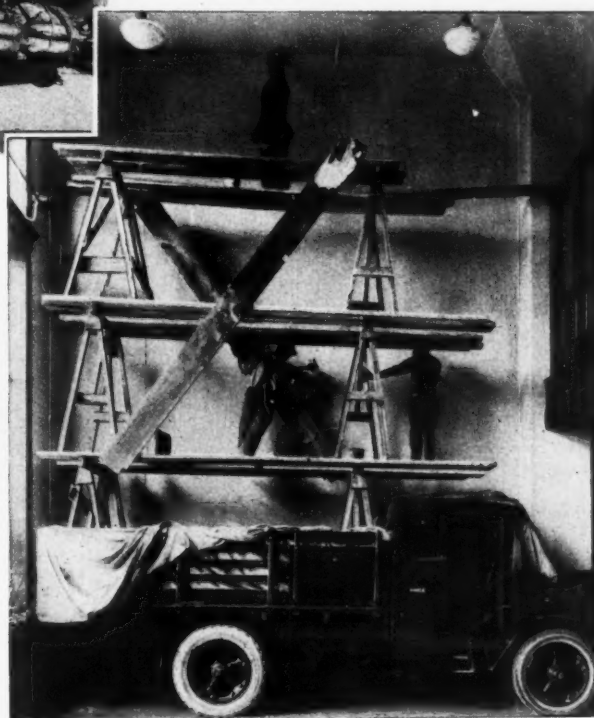
The Rolls-Royce of the desert meets competition. Above is shown the apparatus used by Citroen in the Sahara. Below is a Ford with Citroen feet



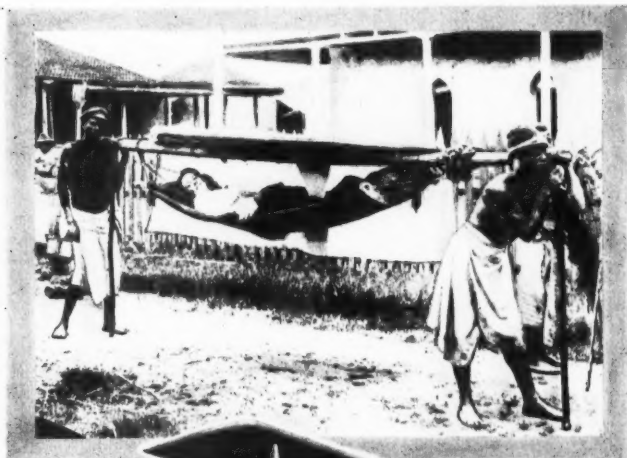
Two instances of where motor vehicles saved the day



Hotels don't mean much in the life of these vaudeville folks, so long as their travelling home stays put



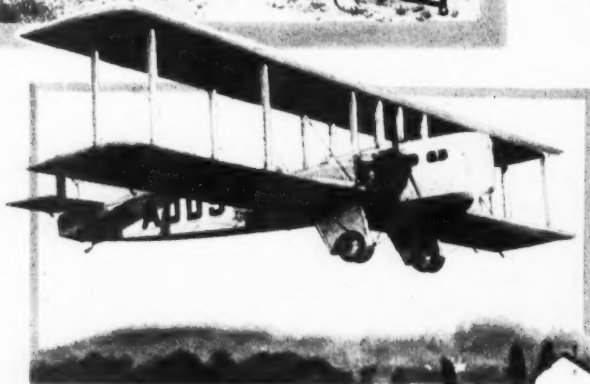
The Slowest And The Fastest In Motor Transportation



If you want the thrill that comes with travelling slow take a ride in a "manchilla" down in Africa



The one-horse open sleigh of bygone days has given way to the modern air-sled, wherein the whirr of the propeller is substituted for the jingle bells



Curves, grades and grade crossings have no place in the running of this express and mail airplane



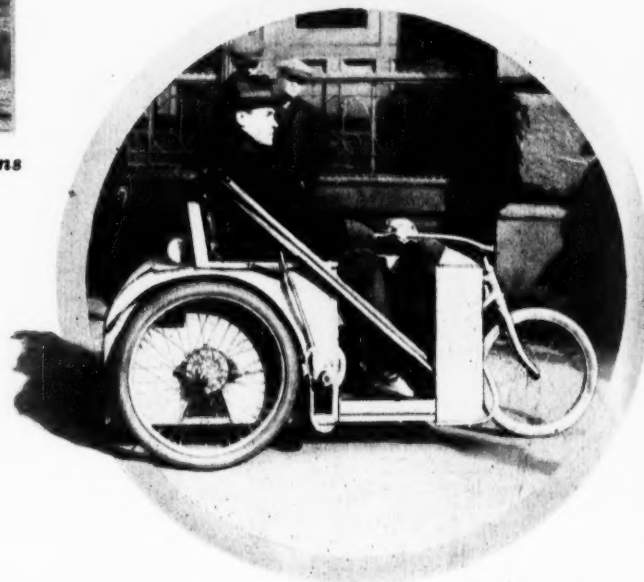
This little Navy-Wright 650 horsepower airplane recently made a speed record of 258 miles per hour. Some "manchilla"



You must admit that gasoline has triumphed when even the Indians and coupunchers take a ride before this Fordson pulled train

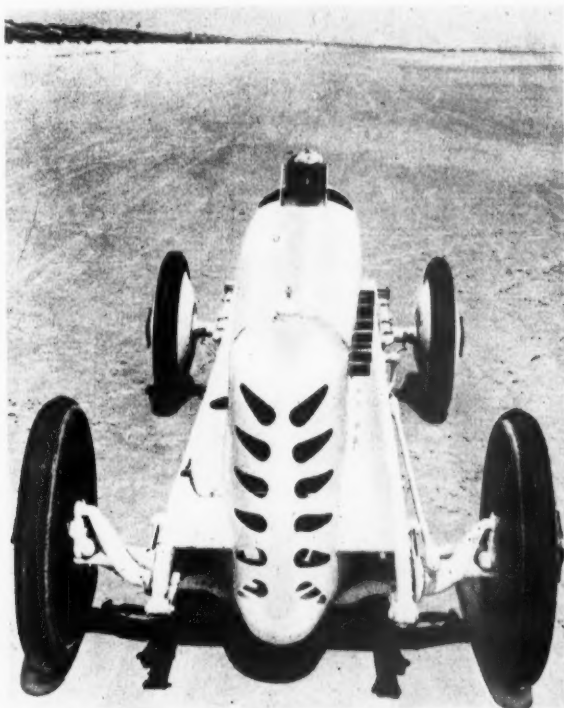


Can you beat it? Here's a fellow who takes no chances with his car being stolen while he eats. He drives right into the front door of the restaurant

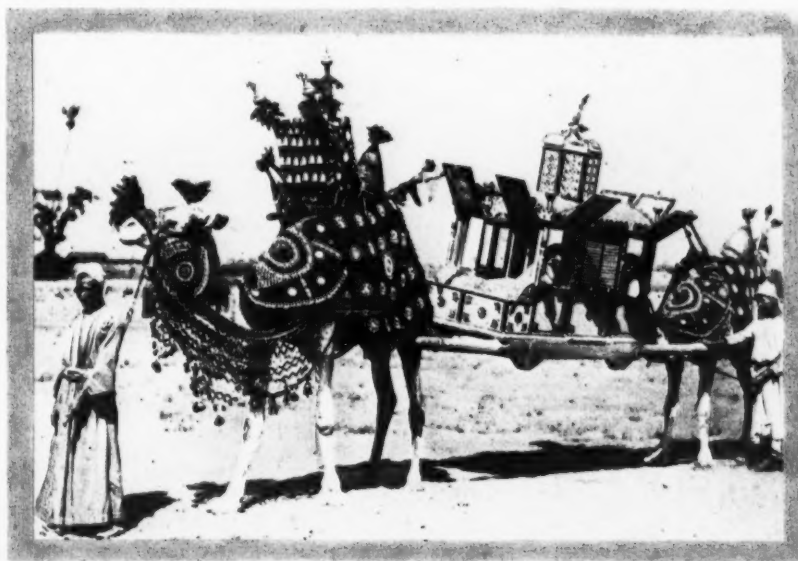


This man built his own motor vehicle, inasmuch as the conventional automobile, owing to his crippled condition, did not fill the bill

Some Extraordinary Uses Of The Motor Vehicle



The man who said "The country is on wheels and we're travelling like hell" must have had in mind Sig Haugdall's record breaking car



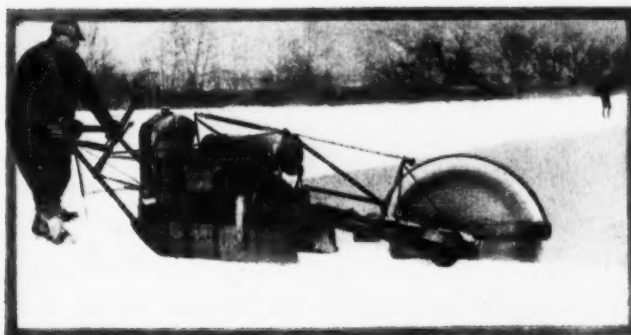
Wonder what a camel thinks about when he sees a gasoline caravan in the desert?



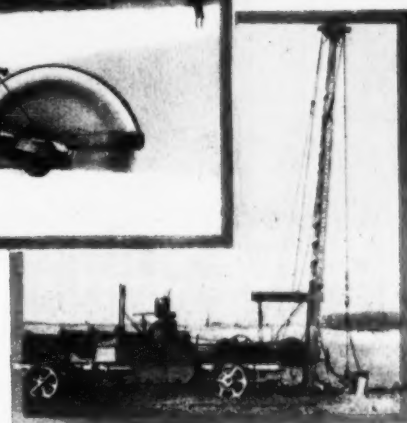
Moving picture companies cannot get along without 'em



Going to the county fair these days means taking your exhibits along by means of trailers



Maybe you don't camp out, cut ice or dig wells, but you ought to know that motor vehicles are used for this



The Motor Truck and Tractors' Part In Road Building



In Siam the question of road building is not uppermost in the minds of the natives who rely on the slower transportation via water buffalo



The motor truck has helped and daily is helping to speed up the work of road building. Aside from transporting material trucks are used to carry the workmen to and from their work



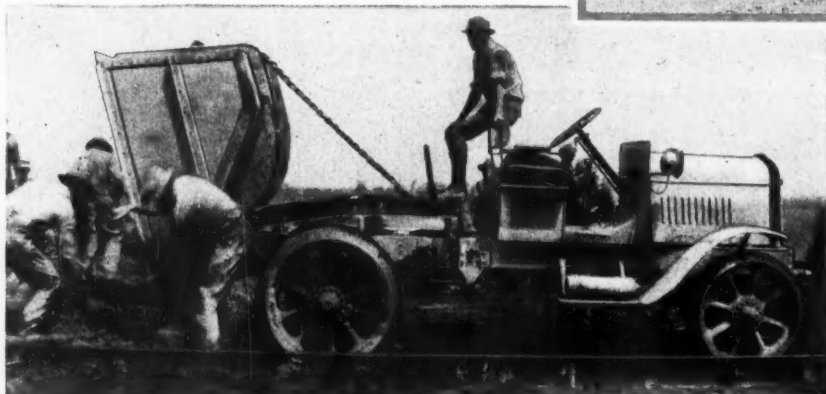
Old Dobbin has been relieved from a lot of hard work with the advent of road building machinery like this



Out in Yellowstone Park they use a tractor and snow plow to open the passes. The engine is behind the plow and quite unlike the old method of placing the horse in front of the plow

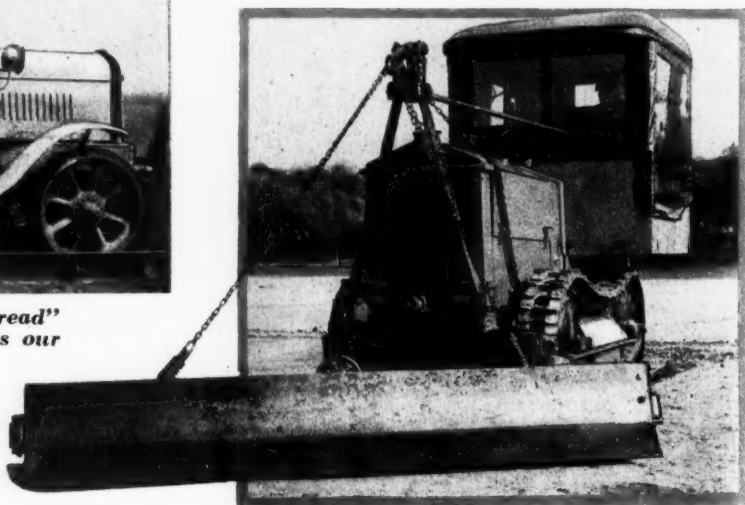


They used to make pretty fast time on the old Elgin race course because the boys with the road building machinery were on the job



"Motor trucks rush in where horses fear to tread" might be applied to some of the difficult places our commercial vehicles must carry on their work

No, dear reader, the picture on the right is not of a gigantic safety razor, but of a road scraper designed to shave the faces of our highways



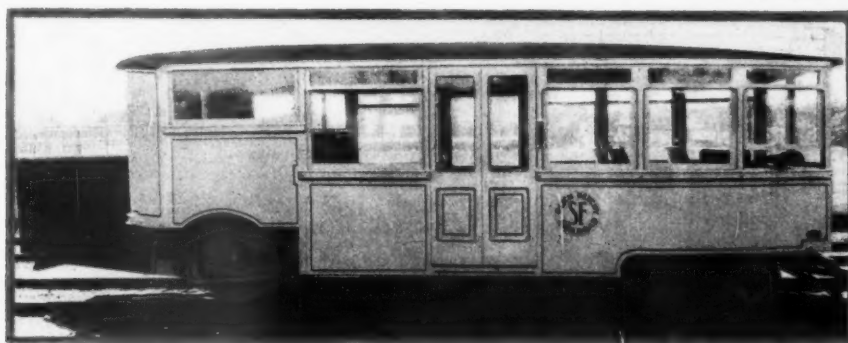
Supplementing Steam With Gasoline On Our Railroads



A White rail car about to leave the station. Notice the queer combination of "cow-catcher" and radiator



Certainly the travel in Japan by kago does not offer any great problems when it comes to maintenance of roads. Overloading is not common because the "truck" soon would register a kick

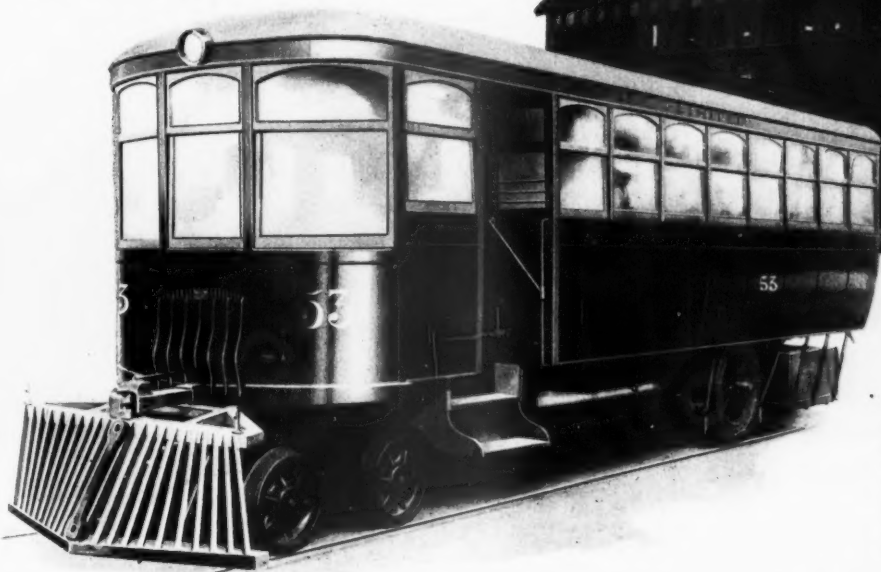


Being a combination of street car, railroad coach and motor truck it is pretty hard to find a real name for the vehicle shown at the left



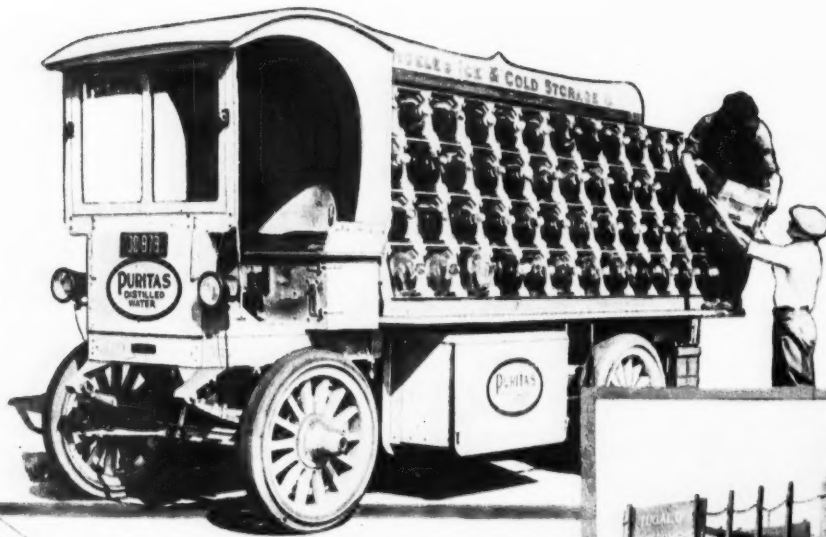
Here we show a couple of rail cars as used by the Mississippi Central line. Unfortunately the youth of the country will miss the familiar "choo-choo"

Below is a rail car developed by the Duplex Truck Co. It is representative of what the field now offers in rail car transportation



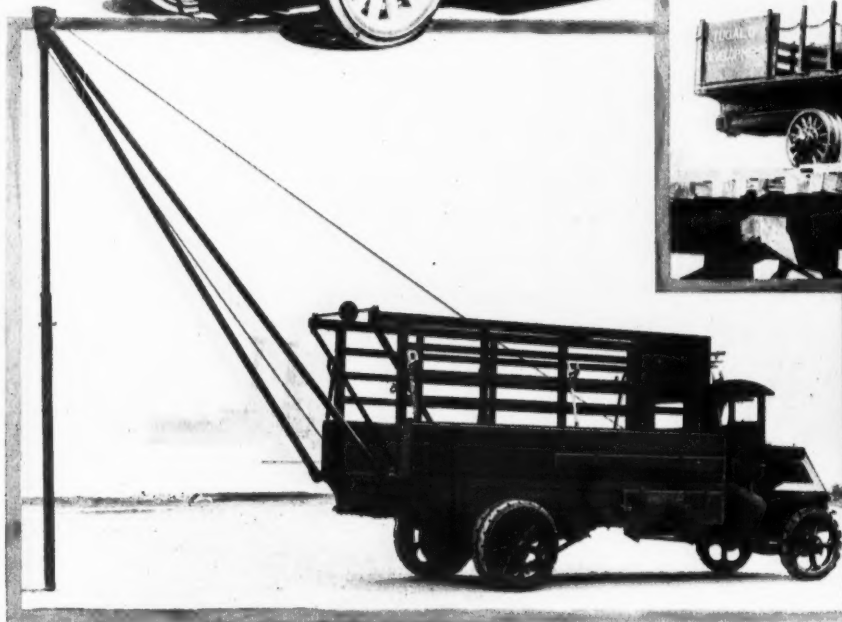
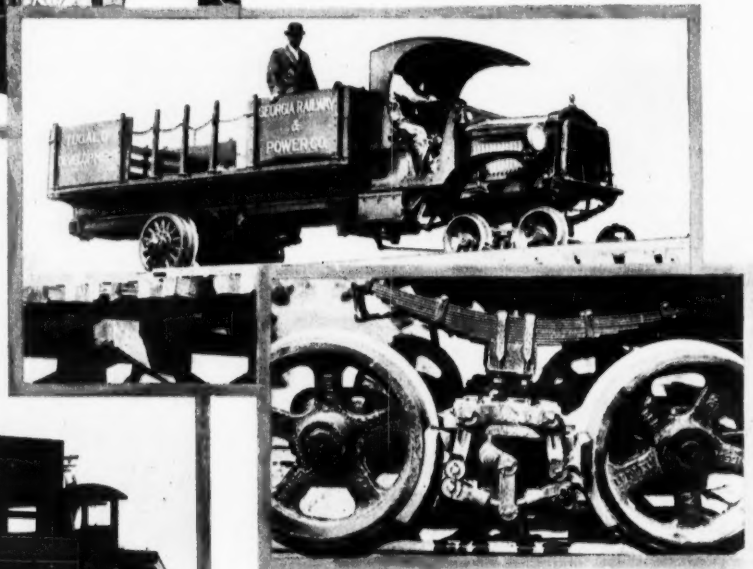
Above is shown the rail car operated by the Northwestern Line. It has all the appearance of the familiar railroad coach. While our present type of rail cars have not departed very much from the usual railroad coach construction it is very likely that the future will see vehicles of different appearance, lighter in construction and far more nimble footed

A Page Of Heavy Duty Performing Trucks

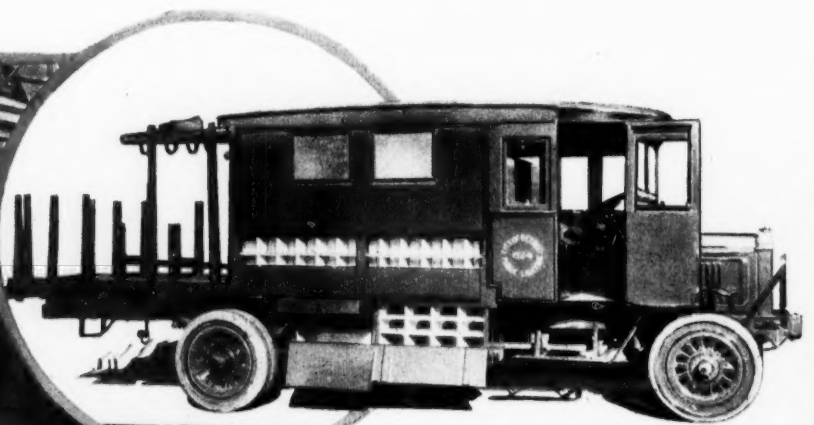
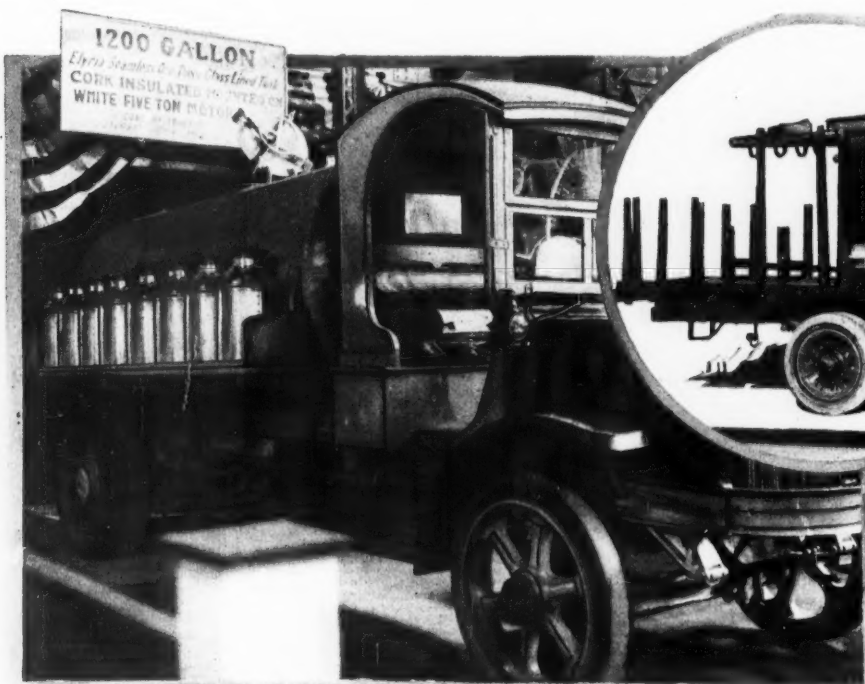


The old horse-drawn beer truck has given way to the modern motor truck dispensing none other than mineral water

Below, combination locomotive and truck used by a construction camp down in Georgia



Not a truck to pull you out of the ditch, but one for cable pulling, erection of poles, and general line construction. It is literally a rolling workshop



Two "big babies" of the highways. The one at the left "peddles" milk, the large tank being glass lined and fitted with means for keeping the milk at correct temperatures

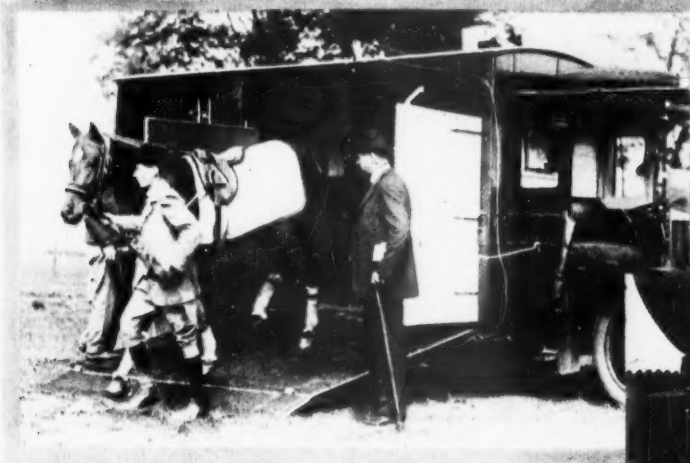
Some Rather Unusual uses of The Motor Vehicle



What a dandy road to kick her wide open, but what's the use when you only have an ox cart. This is a bit of road through Steinbach, Komburg



This is not a wrecking truck or tow car, but one used for bringing in large castings which have become broken and need a welding job

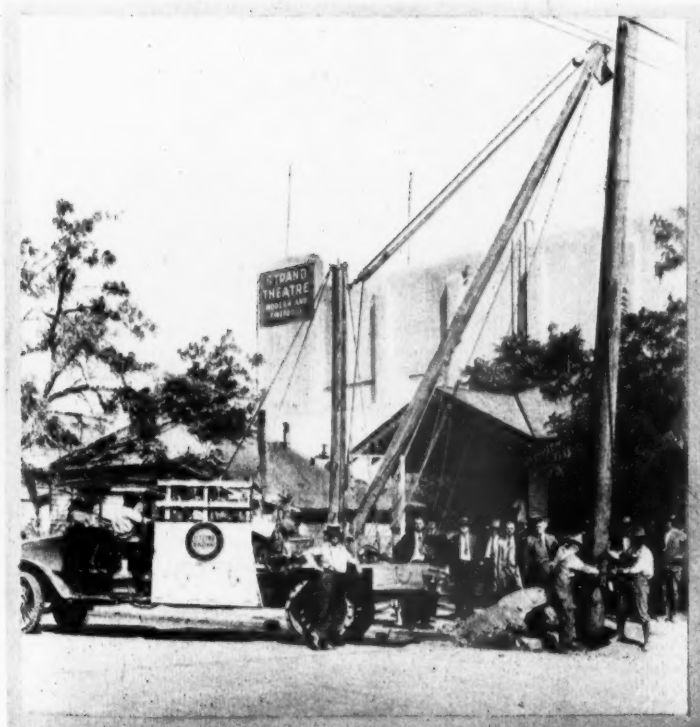


At the left is shown Papyrus, famous English race horse, leaving his specially constructed "Van" as the English call it, at Belmont Park, just before his race with the American horse Zev



Instead of a dozen men it takes only two men plus the truck to set up telegraph poles. The engine of the truck does all the necessary tugging and pulling

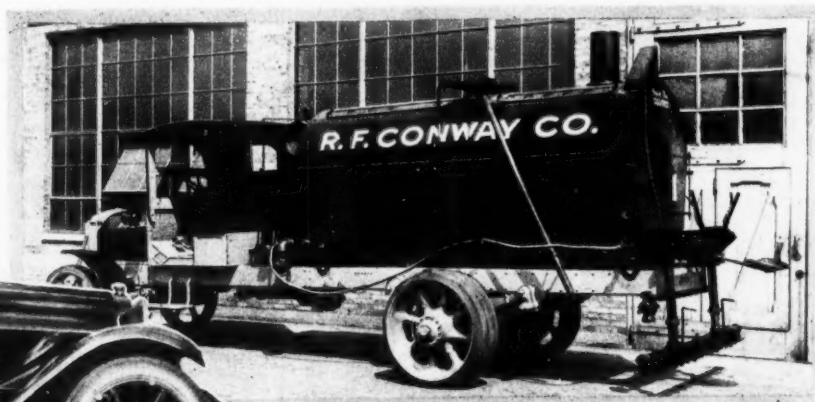
Ironically enough, here we show a whole truck load of thoroughbreds about to take a ride in a horseless vehicle. Do you think the eight horses could pull the truck?



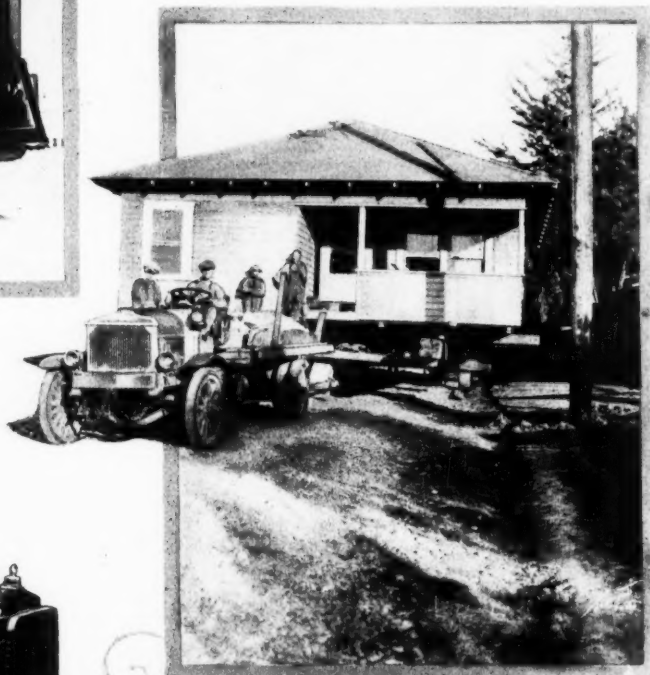
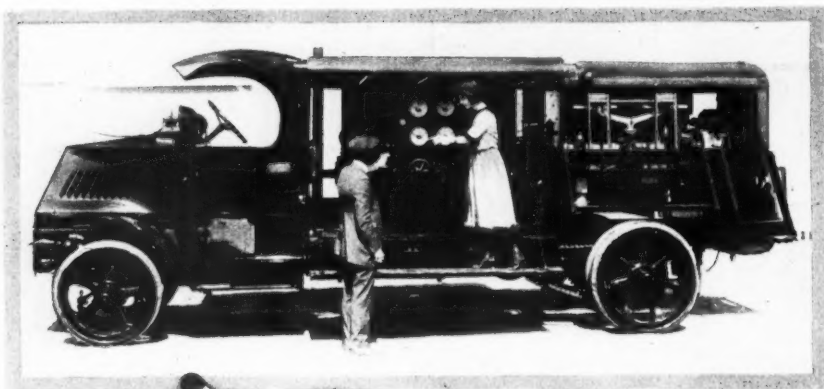
A farmer might want his tractor delivered "pretty darn quick" sometimes and to that end one tractor company uses a motor truck for delivery. If the truck got stuck the tractor could pull it out

Taken From The Realm Of The Motor Truck

Bringing the library right to your door. You can pick out a book to suit your whims or the weather



Trucks may use the highways (in some towns) but here's a truck surfacing a highway. Below, a man moving his 5-room house via truck



An electric light plant used by a movie concern. The other two views show the uses contractors have for the motor truck. No matter what line you may choose, even the bootlegging business, you will find they use a motor truck



Preliminary Facts and Figures of the Automobile Industry for 1923

By ALFRED REEVES

General Manager National Automobile Chamber of Commerce

Production

Cars and trucks.....	4,014,000
Cars	3,644,000
Trucks	370,000
Previous record motor vehicle production, 1922.....	2,659,064
Percentage increase over 1922.....	50%
Production of closed cars.....	1,235,000
Per cent closed cars.....	35%
Total wholesale value of cars	\$2,243,385,000
Total wholesale value of trucks	\$267,500,000
Total wholesale value of cars and trucks.....	\$2,510,885,000
Tire production.....	45,000,000
Wholesale value of motor vehicle tire business.....	\$760,000,000
Total wholesale value of parts and accessories, exclusive of tires.....	\$1,310,000,000
Average retail price of car, 1923	\$811
Average retail price of truck, 1923	\$1,080
Purchasing power of automobile dollar (1913=100)	111 cents
Number of persons employed in motor vehicle and allied lines	2,750,000
Special Federal excise taxes paid to U. S. Government by automobile industry in 1923.....	\$155,000,000

Registration

Motor vehicles registered in U. S. (approx.).....	14,500,000
Motor cars	12,880,000
Motor trucks	1,620,000
World registration of motor vehicles.....	17,000,000
Per cent of world registration owned by U. S. A.....	85%
Motor vehicle registration on farms.....	4,250,000
Motor cars	3,890,000
Motor trucks	360,000
Miles of improved highway.....	430,000
Total miles of highways in U. S.....	2,941,294

Automobile's Relation to Other Business

Number of carloads of automobiles, parts, and tires shipped over railroads.....	750,000
Per cent of rubber supply used by automobile industry	70%

Per cent of plate glass supply used by automobile industry	36%
Per cent of copper supply used by automobile industry	14%
Per cent of aluminum supply used by automobile industry	25%
Per cent of iron and steel supply used by automobile industry	4%
Per cent of upholstery leather supply used by automobile industry.....	54%
Gasoline consumed by motor vehicles, 1923 (gals.)	5,404,184,000

Motor Bus and Motor Truck

Number of motor buses in use.....	51,000
Number of consolidated schools using motor transportation	12,500
Number of street railways using motor buses.....	107
Number of railroads using motor vehicles on short lines.....	157

Exports

Number of motor vehicles exported.....	328,333
(From U. S. factories and Canadian plants owned in U. S. A.)	
Number of motor cars exported	189,884
Number of motor trucks exported	37,049
Number of assemblies abroad of American cars	101,400
Value of motor vehicles and parts exported.....	\$234,129,000
(Including engines and tires)	
Rank of automobiles and parts among all exports.....	6th
Per cent of motor vehicles exported.....	8%
Imports of motor vehicles.....	890

Motor Vehicle Retail Business in U. S.

Total car and truck dealers.....	43,607
Public garages.....	50,911
Service stations and repair shops.....	67,802
Supply stores.....	65,988

23 Years Ago This Week In Motor Age

(From MOTOR AGE of Jan. 2, 1901.)

A Patent Office Prediction

WASHINGTON, Dec. 29.—“The motor vehicle will become as great a fad in a few years as the bicycle, and will outlive it because of its universal utility,” said Commissioner of Patents Duell to a group of newspaper men recently assembled in his office. “A few years ago the patent office was fairly deluged with applications for patents for new ideas and improvements in bicycles. Today we are passing through much the same experience. Hundreds of applications are being received each week and I look for a revolution in motor vehicle art within a short time. The inventive genius of American inventors is second to none in the world and our inventors are evolving even now a vehicle which I do not doubt

will rival the world. Our makers of motor carriages have entered upon the new industry with a valiant spirit and have already set new and higher standards of construction, finish and general excellence.”

First National Automobile Exhibition

The management of the First National Automobile Exhibition, to be held at Chicago in March, have been advised by the Central Passenger Association that a rate of one fare and a third has been granted from all points in its territory. The Chicago show management has commenced to issue a Weekly Bulletin, of which 10,000 copies will be distributed. They are intended to reach persons interested in vehicles in and out of the trade.

Brief News Notes

Those who are on the inside at the Winton factory say that President Alexander Winton is spending 14 hours a day inside his experimental sanctum, the doors of which are kept bolted and barred except to a chosen few. It is said that several wonderful machines are being designed and constructed within the walls of this shop and it is predicted that next spring will see a revolution of all existing Winton road records, not to mention exhibitions of speed which will open the eyes of even foreign enthusiasts. Mr. Winton has the racing fever worse than ever and will leave no stone unturned to keep at the head of the procession in this respect.

C. G. Fisher & Co., Indianapolis, are the state agents for the Mobile and are doing considerable touring and interesting the people of the neighboring towns.

Automotive Developments of the Week

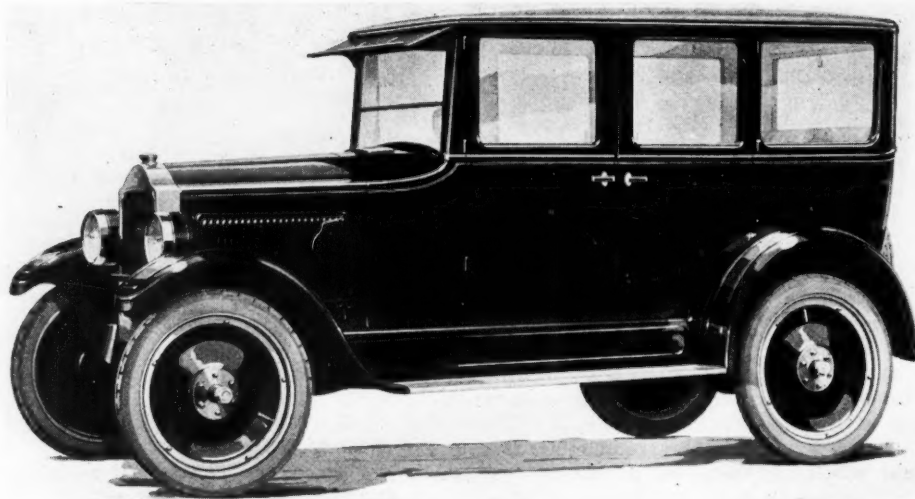
Gray Motor Corp. Add Three New Models

IN addition to the present line of cars, the Gray Motor Corporation is bringing out three new models which are characterized by modified lines, longer wheelbase and several chassis revisions. The new series consists of a touring car which is listed at \$630, a coupe at \$735 and a five passenger sedan at \$875. These prices include the following equipment: cord tires, demountable rims, dash light, gasoline gage, nicked radiator and hardware and disc wheels on the sedan, wood wheels being optional.

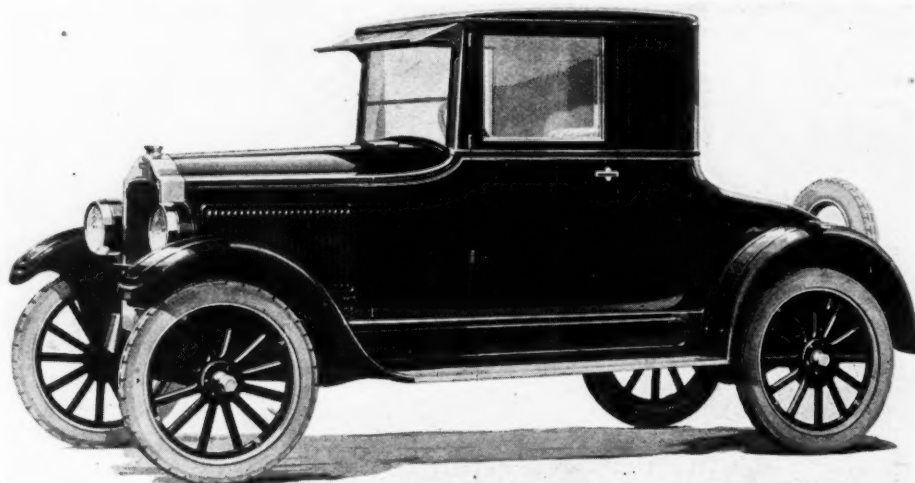
With the addition of 4 in., the wheelbase is now 104 in. This additional length has been applied to greater leg room in all three of the new series bodies. The gasoline tank has been removed from under the cowl and is now suspended at the rear end of the frame and the capacity has been increased to 10 gals. Fuel is fed to the carburetor by a vacuum tank which is located on the forward side of the dash.

Fabric universal joints have supplanted the metallic joints which were formerly located at each end of the propeller shaft. Slight changes have been made in details to improve the performance of the brakes and springs. The speedometer drive is now taken from the tail shaft of the gear box. Driving ability has been improved by placing the horn button at the top of the steering post at the center of the new aluminum spider which carries a natural wood rim. Instruments have been grouped in a panel at the center of the instrument board.

Considerable attention has been devoted to the design and construction of the new bodies. Roominess is the first striking characteristic resulting from the changed lines. In order to balance the appearance of the entire car with the larger bodies, the hood and radiator lines have been modified to suit the



The Gray sedan which sells for \$875. Wood wheels are optional on this model



Gray coupe, showing the modified body lines. The radiator is higher and the body frame has been strengthened

existing trend of design. The radiator is higher than formerly and has straight line sides which terminate in sharp upper corners that also form the ends

of the curved line that forms the top of the radiator and hood line. Deep, double-crowned fenders round out the car appearance.

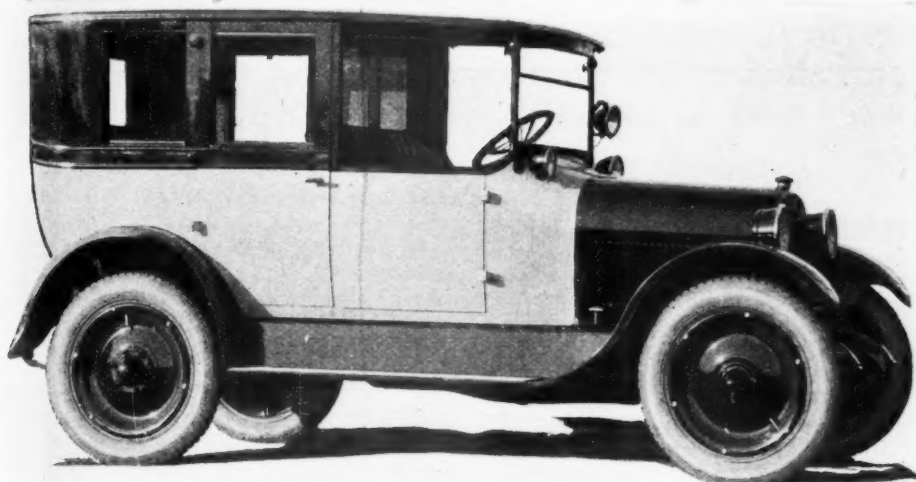
To insure rigid body construction, an increased number of ribs have been built into the wood frame which supports the steel body panels. Roofs on the closed cars are built over a longitudinal slat construction which is supported by lateral ash bows at a distance of 10 in. apart from front to rear. Doors on the closed models are provided with two rubber bumpers and a spring dovetail pilot to eliminate rattle and rumble. Locks are also built into all closed car doors.

All three models are conventional in design and arrangement. The open car is upholstered in leather fabric over deep curled hair while the sedan is finished in velour and the coupe in blue leather fabric. Seat cushions are built on wood frames which are provided with concealed cleats that register with the seat box instead of fitting into cushion retainers in the conventional manner.



The new series Gray touring car which has a longer wheelbase and sells for \$630

Reo Cab Body Built to Take Care of Repairs Easily



The Reo cab, which is furnished in a standard color scheme of lemon below the belt, orange above the belt, orange wheels and black top and hood

THE Reo taxicab, which enters its third year of production, has been designed and built with a knowledge of the severe service to which the average taxicab is subjected. Accidents, especially in the larger cities, are not always avoidable and to that end the cab has been built to take care of body repairs in the shortest time possible.

The upholstery is detachable, being held in place with screws. The passenger seat back cushion is removable as a unit.

Although the chassis used for this taxicab is of short wheel base to permit of easy maneuvering in traffic and narrow streets, the seating arrangement provides comfortable accommodation for five passengers in addition to a spacious compartment for the carrying of luggage. The proportions of this body meet the requirements of all states having ordinances governing such matters.

The exterior panels are of heavy gauge steel. A heavy steel moulding reinforces the rear corners and also serves as a protection against serious damage to the body at those points in case of collision. The top is of sound deadening slatted construction covered with water proof fabric.

The wide rear doors are hung on three heavy hinges and provided with double catches to prevent accidental opening. The shape of the door post and the manner in which it is upholstered combine to form a cushion for the protection of the passenger's fingers should they be trapped between the door and the post when pulling the door closed.

A hand rail guards against the passenger placing his fingers between the door and the post, however, the above safety feature serves to guard any possibility of such an accident. A two-piece phosphor-bronze stop strap insures against the door flying open beyond a given limit. When the doors are closed the straps disappear in the door posts. The front doors are hung on two heavy hinges.

The door, rear quarter and rear windows are set in felt channels which prevent rattles. These windows are of the

adjustable disappearing type being controlled by leather straps. The glass in the partition between the driver's and passenger's compartment is of the woven wire type which protects the passengers from flying glass in case of accident. This kind of glass will not shatter when broken.

The right partition glass is set in paraffin felt channels and can be slid open by the passenger so as to communicate with the driver or for the purpose of additional ventilation. The paraffin felt channels are long wearing and prevent binding of the glass. Aluminum strips support the channels. These strips are easily adjustable to remove play in the channels and thereby eliminate window rattle.

The window trim strips are of American Walnut with the exception of the low strips which are of aluminum. The window straps pass through the aluminum strips. The aluminum strips will withstand considerable abuse and retain their appearance indefinitely.

The cushions, backs and side trimming



To get a clean floor and eliminate catch traps dirt, the auxiliary seats in the Reo cab are hinged to the partition

below the belt line are of genuine leather. Dual tone, Spanish grain leather is used in the passenger compartment, while black leather covers the driver's seat. Long grain, semi-bright moroccoline is used above the belt line in the passenger's compartment.

A tonneau heater with heavy aluminum register placed in the heel board of the rear seat is standard equipment. The heater is regulated by the driver from the front compartment.

Provision has been made in the partition to accommodate any one of three kinds of enclosed meters: viz., Ohmer, American and Pittsburg. A steel brace six inches wide and 3-16 inch stock extends across the front partition reinforcing all pillars and serving as a bracket base for the mounting of a meter of the enclosed type.

The lighting equipment includes headlights, side lights, spot light, tail light, "vacant" light, and dome light. The dome light is equipped with independent switch which can be operated by passengers. Switches are also provided within easy reach of the driver for the control of the meter and "vacant" lights.

The standard color scheme for Reo taxicabs is lemon below the belt, orange above the belt, orange wheels and black top. The hood is finished in black enamel.

Model Sixty Westcott Sedan Newcomer in Field

IN announcing a new five-passenger sedan, Model 60, The Westcott Motor Car Co., Springfield, O., points out that the completely new chassis on which this sedan is built was engineered throughout as a closed car chassis.

One feature of the new car is the new Westcott six cylinder engine, which has a seven-bearing crankshaft. The bore is 3 1/4 and the stroke 5 inches.

Four wheel brakes and balloon tires will be optional equipment on the new model at extra cost. The brakes are of the internal type on all four wheels.

The car weighs a little more than 3000 pounds.

The chassis construction permits a low mounting of the body, and this, together with the body design, has resulted in a good appearing car. The interior is roomy and is upholstered in velour.

Maximum rigidity is a feature of the frame construction. This is secured by a large plate tying together the entire rear of the frame, in addition to the usual cross members, and there is also a tubular cross member at the front horns.

Delco starting, lighting and ignition, Stewart-Warner vacuum system and Rayfield carburetor are standard equipment. The manifold design of the new Westcott engine, together with thermostatic control of the gasoline mixture in the carburetor, are said to make the engine efficient.

Another Letter From Charles H. Emmons



MAXWELL MOTOR VEHICLES

EMMONS MOTOR SALES

9 E. FISK STREET
ASHTABULA, OHIO

CHALMERS MOTOR VEHICLES

Dec. 21, 1923.

Mr. Clyde Jennings.
% Motor Age. Mallers Bldg.,
Chicago, Ill.,

Friend Jennings:-

The time of the year has arrived when we again have the "used car problem" in our midst. Dealers all over the country are having spasms about the used car. Their back rooms are full of them and they have their salesmen out looking for more - "touble". In most cases they have been taken in at 1923 retail values, and they are actually worth 1924 wholesale values - between which there is some difference.

I am secretary of our local dealers association which is in its swaddling clothes. We have not as yet accomplished anything except getting acquainted. Sometimes I think we will do some good. And sometimes I think the association will die aborning. About all that the dealers have found to talk about so far has been the "used car problem".

I am a little afraid that I will lose my job as secretary because I will not take the used car problem seriously. I told them that I had no used car problem, never had one, and never intend to have one. If problems were all I wanted, I could have the place full of them. I could hire a few salaried salesmen to warm the chairs and then I would have a pay-roll problem. I could take in dubious stocks and bonds as part payment for cars and I would have a securities problem, or I could trade for real estate equities and I would have a real estate problem. Or better still I could get married a couple of more times and I would have a woman problem.

In the long run all of these problems are settled in court, -divorce, criminal or bankrupt, - and I am afraid of courts so I don't want any problems.

Of all our problems, the used car is the biggest goat. It is charged with all of the dealer's mistakes from bad credits to too much rent and I suppose that it will always be. About all that I can see to do to solve the used car problem is to be able to appraise a used car for what it is worth or hire a man that is able. Don't overstock with anything whether it is new or used, and buy your used cars right or not at all.

Probably I am "thick headed". If I were a little more brilliant or capable I might be able to have a used car problem. But as it is, I am not.

You have not had any of my ravings for so long that I thought you might think I had forgotten your magazine. "Hence the letter".

Wishing you the compliments of the season, I remain

Very truly yours,

Charles H. Emmons
Emmons Motor Sales.

CHE/EMS

Maintenance Must Be Merchandised

Maintenance Merchandising Is Entitled to Scientific Research Data As a Step Towards Closer Estimating the Reputable Establishment Should Be Supplied With Repair Parts Price Lists

By PAUL DUMAS

Preceding articles in this series were published on June 21, July 12, August 23, September 13, October 4, October 25, November 22 and December 13, 1923.

FLAT Rate has brought about more real improvements in the maintenance business than any other development in recent years. Unconsciously perhaps, many of these improvements are being applied in establishments the owners of which have only a hazy idea of Flat Rate. Trace any worth while idea that has to do with the maintaining of automobiles and you will find invariably that it is an outgrowth of the FUNDAMENTALS REQUIRED FOR THE OPERATION OF THE FLAT RATE PLAN.

Cash payment for repair work, mechanics' compensation plans, adequate repair parts stocks, time saving shop equipment, and all around better working conditions are a few of the recent improvements forced into existence by the big idea behind Flat Rate.

Considering what has been accomplished it is reasonable to believe that in the not far distant future maintenance will become far more stable than the manufacturing end of the industry as it now exists. This is a certainty if the Maintenance business is given the study that its large dimensions command.

Maintenance Processes Are Factory Modifications

Although there are opinions to the contrary it is our private belief that maintenance processes are to a great extent a transplanting of factory methods on a smaller scale. The businesses of maintaining watches and footwear are good examples of the small scale transplanting of factory facilities.

If we concede that the rebuilding and maintaining of a motor vehicle requires certain facilities that are similar to the manufacturing facilities we must admit that maintenance should have certain and definite data for their application. This brings us to the three things that make up an automobile. They are MATERIAL, DESIGN, and WORKMANSHIP.

Where Does the Dealer Fit

As far as Material and Design are concerned the average maintenance dealer knows just about what standards to follow. He has learned to distinguish between a quality repair part and one made to sell at a price. He has learned that all replacement parts makers are not pirates.

Regarding the item of design he has found that to attempt any wholesale redesigning of the original product usually results in failure. He knows all these things, but largely from a technical viewpoint.

When we come to a consideration of

the Workmanship factor, which has both technical and merchandising aspects, we find some but not nearly enough definite standards. In other words there has not been anywhere near a complete transplantation of ENGINEERING SPECIFICATIONS AND MANUFACTURING TOLERANCES from the factory to the shop. MAINTENANCE COST DATA which is necessary for the sensible merchandising of the wares of the dealer in repairs is something practically unknown.

Maintenance Merchandising Research

If we can apply certain standards or certain definite information to cover the other phases of maintenance why shouldn't we have definite data regarding the following:

1—The maximum looseness or wear allowable in a part before it should be replaced.

2—The maximum and minimum limits of clearances between moving or adjacent parts.

3—Whether the cost of a new PART would be less or more than the cost of labor necessary to recondition the old one.

4—Whether the cost of a new UNIT would be less than the cost of labor and individual parts necessary to recondition the old one.

5—The economic phases of the COMPLETELY REBUILT CAR in relation to new car purchases.

Sources of Information

Information covering the first two items is not difficult to compile and any up to date manufacturer should be able to adapt his Engineering Specifications for the purpose. The adaption of this information would be called Maintenance Specifications. The limits would be determined by actual experience rather than by theoretical calculation.

Such information, to do the most good, should be so arranged that the workman would know definitely the Desirable, the Allowable, and the Rejection standards. In other words it should be made plain to the workman that one and one-half to two and one-half thousandths of an inch is the Desirable clearance between a valve stem and the valve guide, that three to four and a half is Allowable, and that six thousandths or over is too much. In like manner the data should be made to cover the limits of backlash in gears, end play in shafts, etc.

One of the most complete compilations of maintenance specifications is contained in the Wills Sainte Claire Service Manual. A portion of the specifications are printed on pages 40 and 41.

What They Are Good For

Specifications such as have been described automatically answer the question, "Is a new part necessary or can the unit or part be reconditioned to the Maintenance Specifications?" The usefulness of this data does not end here because in addition they permit an accurate check on the degree of interchangeability of repair parts. WITHOUT SOME STANDARD OF MAINTENANCE SPECIFICATIONS THE USE OF PRECISION TOOLS IS MEANINGLESS.

Maintenance Cost Data Has Been Overlooked

The sum of all the benefits that can be derived from Maintenance Specifications can be stated in these words; they indicate where and when maintenance work is necessary. In other words they answer items No. 1 and No. 2. We must still consider the remaining three.

A thorough consideration of items 3, 4, and 5 involves the economics of the automobile business, the used car situation, and the production of new cars. It is too big a subject to be covered in this series but there are certain of the details that have a direct relation to the welfare of the maintenance dealer.

The Rebuilt Car

At the present time there is a noticeable lack of accurate information regarding the status of the rebuilt car. It is perhaps due to the fact that the idea of the completely rebuilt car does not fit in with some new car sales programs. There is also a lack of standardization in the definition of the "rebuilt car".

What is needed is definite figures relating to the cost of rebuilding as compared to the trade in value of the car. There is nothing in the shape of a mileage computation of the value of rebuilding. It is a difficult proposition to sell \$400 worth of paint, tires, and mechanical repairs to a car owner who can take the old car over to some dealer and for the same amount plus the old car come away with a new one of the latest model.

Items Three and Four

An easy and not far fetched step is the right direction would be to MAKE AVAILABLE TO EVERY REPUTABLE REPAIR SHOP THE MANUFACTURER'S PARTS PRICE LIST. These lists should contain the prices of the parts listed.

As an example of the interrelation between the technical and financial aspects of the items listed, let us consider the following probable cases: An engine

(Continued on page 41)

Flat Rate Schedules. Chassis—Lubrication, Inspection and Maintenance Saving Operations

While the car is in the shop for lubrication is a good chance for the sale of further work. The operations listed for the Maxwell offer a good basis for the dealer to compile operations for the cars in his territory. Note—On all schedules where there is an entry under the "Total Charge" column the amount entered always includes time and material.

MAXWELL—After car No. 193801

Operation	500 MILES OPERATION.	Max. Time	Parts Prices	Labor Charge	Total Charge
Operation No. 400	Grease all compressor nipples except steering gear case nipple. Grease steering gear drag link, oil all brake rod and clutch pull rod connections, emergency brake cam rollers, spark and throttle control connections, ignition distributor shaft and all oil reservoirs.	1 hr.			
Operation No. 400T	IN CONJUNCTION WITH 500 MILE GREASING JOB No. 400 do the following work: Tighten all spring clips and shackles, bolts, inspect brake rod connections, adjust brakes, tighten tie rod bolts, tighten rim lugs.	2 hrs.			
Operation No. 401	1000 MILES OPERATION. Same as operation 400 plus drain old oil from engine and replenish with new. Oil horn, starting motor and generator. Remove front and rear wheels, clean and grease bearings.	4 hrs.			
Operation No. 401T	IN CONJUNCTION WITH 1000 MILE GREASING JOB No. 401 do all work listed in operation 400T plus the following: Tighten fenders and hood sills, tighten radiator, drain radiator, flush and fill with fresh water, drain carburetor, clean screen and adjust. Clean spark plugs, clean and adjust distributor, check ignition timing.	3 1/2 hrs.			
Operation No. 402	2000 MILES OR SEASON OPERATION. Same as operation 401 plus the following work: Drain differential, transmission and clutch. Replenish with fresh lubricant. Grease steering gear case compressor nipple. Clean and adjust ignition distributor contact points. Check timing. Lubricate springs with penetrating oil.	5 hrs.			
Operation No. 402T	IN CONJUNCTION WITH 2000 OR SEASON GREASING JOB No. 402 do all work listed in operation No. 401T plus the following: Drain and clean vacuum tank, clean sediment out of gasoline tank, tighten body bolts, check wiring, tighten all terminals, tape worn spots in insulation, clean commutator on generator, adjust charging rate, clean and adjust cut-out points.	5 hrs.			
Operation No. 403	DRAIN CLUTCH HOUSING. Wash out with kerosene and fill with fresh lubricant.	1/2 hr.			
Operation No. 404	REMOVE AND INSTALL ONE WHEEL. Clean bearing and pack with fresh grease.	each 3/4 hr.			
Special	TAKE ALL SQUEAKS AND RATTLES OUT OF CAR. Sell on time basis only.	each 1 hr.			
Operation No. 405	TIGHTEN body bolts, fenders and hood sills, oil hood hooks.	1 1/2 hrs.			
Operation No. 406	CHECK FUEL SUPPLY SYSTEM. Includes drain sediment out of gasoline tank, drain and clean vacuum tank, clean and adjust carburetor, blow out fuel pipes.	1 1/2 hrs.			

PAIGE 6-66 AND JEWETT

Operation	OIL AND GREASE CAR COMPLETE. INCLUDES: Same work as Hudson operation 402H.	Max. Time	Parts Prices	Labor Charge	Total Charge
Operation No. 402	CHANGE LUBRICANT IN TRANSMISSION, REAR AXLE AND UNIVERSAL JOINTS. INCLUDES: Drain old lubricant, wash with kerosene and replenish with fresh lubricant.	1 1/2 hrs.			
Operation No. 404	GREASE ALL WHEEL BEARINGS. Does not include removal of rear wheels.	1 hr.			
Operation No. 400	FILL ALL GREASE CUPS AND TURN DOWN ONCE. INCLUDES: Same work as Maxwell operation 400.	1 hr.			
Operation No. 408	TIGHTEN ALL BODY BOLTS. INCLUDES: Same work as Hudson operation 408.	3 hrs.			
Operation No. 412	TUNE ENGINE. INCLUDES: Cleaning and spacing spark plugs, cleaning and adjusting ignition contacts, check ignition timing, clean and adjust carburetor.	1 hr.			
Operation No. 413	CLEAN ENGINE. INCLUDES: Removal of all grease and dirt from engine assembly.	1 hr.			
Operation No. 414	CLEAN AND PAINT ENGINE. INCLUDES: Cleaning and application of one coat of engine paint.	3 hrs.			

DODGE—All models

Operation No. 402	DRAIN AND LUBRICATE ENTIRE CAR (equipped with Alemite system). IN- CLUDES: Washing out and lubricat- ing the following units: engine, trans- mission, universal joint, rear, axle, spring leaves and wheel bearings.	6 hrs. 7 hrs.
Operation No. 400	GREASE CAR. INCLUDES: Same work as Maxwell operation 400.	1½ hrs.
Operation No. 401	GREASE CAR. INCLUDES: Same work as Maxwell operation 401.	5½ hrs.
Operation No. 404	REMOVE, CLEAN, LUBRICATE and ADJUST ALL WHEEL BEARINGS. INCLUDES: Front and rear wheels.	2½ hrs.
Operation No. 407	LUBRICATE SPRING LEAVES. IN- CLUDES: Same work as Hudson operation 407.	2½ hrs.
Operation No. 411	CHANGE LUBRICANT IN TRANSMIS- SION, REAR AXLE AND UNIVERSAL JOINT. INCLUDES: Same work as operation 411 Paige and Jewett.	2 hrs.
Operation No. 409	BLOW OUT FUEL PIPES AND CLEAN VACUUM TANK.	1½ hrs.
Operation No. 408	TIGHTEN BODY BOLTS. INCLUDES: Tighten all body bolts and install one new bolt if necessary.	¾ hr.
Operation No. 412	TUNE ENGINE. INCLUDES: Remove, clean and adjust spark plugs, clean and adjust carburetor. Clean and ad- just ignition contact points. Blow out fuel lines and clean vacuum system.	2 hrs.
Operation No. 413	CLEAN ENGINE. INCLUDES: Same work as Paige plus cleaning under side of hood and front of dash.	1½ hrs.
Operation No. 414	CLEAN AND PAINT ENGINE.	2 hrs.

HUDSON SUPERSIX AND ESSEX

Operation No.	THOROUGH LUBRICATION, GREASE CUPS, INCLUDES: Lubrication of each and every part of engine and chassis and that requires lubrication. Change oil in engine. Grease clutch, transmission and rear axle by adding sufficient oil and grease to bring to proper level. Includes filling universal joints and all grease cups. Grease cups to be turned down until grease is forced out between moving parts and the grease cups to be refilled. Front wheels to be removed, bearings cleaned, repacked and adjusted.	Max. Time	Parts Prices	Labor Charge	Total Charge
Operation No. 402H	THOROUGH LUBRICATION, OIL CUPS, INCLUDES: Same work as operation 402 and is for cars equipped with oil lubrication.	3 hrs.			
Operation No. 402C	FILL ALL GREASE CUPS AND TURN DOWN ONCE. This operation covers same work as Maxwell operation No. 400.	2 1/4 hrs.			
Operation No. 400	WASH OUT AND GREASE CLUTCH. INCLUDES: Drain oil from clutch, wash with one pint of kerosene and refill with a mixture of 1/4 pint of engine oil. Wash clutch twice if necessary.	1 1/4 hrs.			
Operation No. 403	OIL SPRINGS BY SPREADING LEAVES AND GRAPHITING. INCLUDES: Spread leaves, force graphite grease between leaves. Fill grease or oil cups.	1/2 hr.			
Operation No. 407	HUDSON ESSEX TIGHTEN BODY BOLTS. INCLUDES: Tighten body bolts and replace any shims necessary.	6 hrs. 5 1/2 hrs.			
Operation No. 408	CLEAN GAS LINES AND TANK. INCLUDES: Drain carburetor and clean carburetor screen. Remove gas tank, clean gas tank, put gauge in working order or renew, blow out all gas lines with air hose, clean vacuum tank and tank screens and connections.	1/2 hr.			
Operation No. 409	POLISH CARBURETOR BELL, TIGHTEN GLAND NUT. INCLUDES: Drain carburetor, clean spring, polish bell, replace metering pin, if necessary, tighten gland nut. Carburetor is NOT removed from block for this work.	1 1/4 hrs.			
Operation No. 410	INSTALL ELECTRO FOG.	1/2 hr.			

LINCOLN—All models

Operation No.	THOROUGH LUBRICATION, GREASE CUPS, INCLUDES: Lubrication of each and every part of engine and chassis and that requires lubrication. Change oil in engine. Grease clutch, transmission and rear axle by adding sufficient oil and grease to bring to proper level. Includes filling universal joints and all grease cups. Grease cups to be turned down until grease is forced out between moving parts and the grease cups to be refilled. Front wheels to be removed, bearings cleaned, repacked and adjusted.	Max. Time	Parts Prices	Labor Charge	Total Charge
Operation No. 418	REMOVE AND CLEAN SPARK PLUGS. ADJUST PLUG GAPS. HONE AND ADJUST INTERRUPTER CONTACTS.	1 1/4 hrs.			
Operation No. 419	BLOW OUT FUEL TANK LINE AND CLEAN VACUUM TANK.	1 hr.			
Operation No. 406L	REMOVE, CLEAN, LUBRICATE AND ADJUST four WHEELS. INCLUDES: Same labor as Maxwell operation 404.	2 1/4 hrs.			
Operation No. 404	REPLACE ANTI-SQUEAK SHIM (shim up) under BODY.	3 1/2 hrs.			
Operation No. 420	TIGHTEN ALL BODY BOLTS. INCLUDES: Same work as Hudson or Paige operation 408.	1 1/4 hrs.			
Operation No. 405	TIGHTEN FENDER BOLTS.	1 hr.			
Operation No. 421		1/2 hr.			

PACKARD—Single Six Models 116, 126 and 133

Operation No.	SEASONAL LUBRICATION or DRAIN AND LUBRICATE ENTIRE CAR. INCLUDES: Same work as Maxwell operation 402.	Max. Time	Parts Prices	Labor Charge	Total Charge
Operation No. 402	MATERIAL 9 Pts. gear oil. 1 Gal. kerosene. 2 1/2 Gals cylinder oil. Oil strainer gasket.				\$11.90 11.15
Operation No. 401	Note: Labor required for both models is same but 126 and 133 require 7 Qts. cylinder oil. GREASE CAR 5000 MILES OPERATION. INCLUDES: Same work as Maxwell operation 401 except that rear wheels are not included. Includes adding water to battery.	3 hrs.			
Operation No. 400	MATERIAL Approximately same as for operation 402.	2 1/4 hrs.			7.50 6.75
Operation No. 411	FILL ALL HIGH PRESSURE GREASE FITTINGS. INCLUDES: Same work as Hudson operation 400 plus adding water to battery.	1 1/4 hrs.			.90
Operation No. 407	LUBRICATE SPRING LEAVES. INCLUDES: Same work as Hudson or Dodge starter.	3 hrs.			
Operation No. 411	CHANGE LUBRICANT IN TRANSMISSION, REAR AXLE and engine crankcase. INCLUDES: Same work as Bulck operation 411.	1 1/2 hrs.			
Operation No. 409P	CLEAN OUT GAS TANK LINES, CARBURETOR AND VACUUM TANK. INCLUDES: Same work as Hudson operation 409 except that tank is not removed and no work is done on gas gauge.	2 1/2 hrs.			

OVERLAND AND WILLYS KNIGHT—Overland Models 92RB, 91, 4, 4A, 75, 90, 85-4, 88-6, 89-6, 88-4. Willys Knight Models 64, 67, 20A, 20

Operation No.	OIL AND GREASE CAR THOROUGHLY. INCLUDES: Same work as operation 402 on Hudson. Models 91, 92RB, 4, and 4A.	Max. Time	Parts Prices	Labor Charge	Total Charge
Operation No. 402	Other Overland Models Note: Add 1/4 hr. for closed cars.	1 1/2 hrs. 3 1/2 hrs.			
Operation No. 402W	DRAIN AND LUBRICATE ENTIRE CAR. INCLUDES: Same work as Dodge operation 402, except that spring leaves are not included. Willys only.	2 hrs.			
Operation No. 404	GREASE WHEEL BEARINGS AND FILL ALL GREASE CUPS. INCLUDES: Removal of front wheels. Willys Knight only.	3 hrs.			
Operation No. 422	OVERHAUL OIL PUMP. Models 75 and 85-4. Models 64, 67, 20A. Models 88-6 and 88-4. Model 20. Model 90. Model 89-6.	1 1/2 hrs. 3 1/2 hrs. 2 1/2 hrs. 4 1/2 hrs. 5 1/2 hrs. 1 1/2 hrs.			
Operation No. 409	REMOVE GAS TANK, CLEAN GAS LINES AND TANK. INCLUDES: Same work as Hudson operation 409 EXCEPT that gauge and vacuum tank work is not included. Willys Knight, all models Overland Models 75 Overland Models 90 All others	2 hrs. 4 1/2 hrs. 2 1/2 hrs. 1 1/2 hrs. 2 1/2 hrs.			
Operation No. 421	TIGHTEN ALL FENDERS. All models.	2 1/2 hrs.			

Crankshaft in main bearing—			
Radial .....	.0002	to .0017 loose	.003
End clearance of third bearing			
(Selection of thrust washers) .....	.003	to .005	.008
Flywheel on crankshaft .....	.0003	tight to .001 loose	
Clutch pilot ball bearing outer race in crankshaft .....	.0003	to .002 loose	
Clutch pilot ball bearing inner race on pilot bushing .....	.0001	to .0003 loose	
Intermedite shaft in front bearing—			
Radial .....	.0015	to .0025 loose	.0025
		Selective to .001	
End (Selection of thrust washers) .....	.003	to .005	.009
Oil pump shaft in crankcase bushing .....	.001	to .002 loose	.003
Oil pump driving gear on shaft .....	.0005	to .0015 loose	
Oil pump gear backlash .....	.005	to .008	
Oil pump gear in housing—			
Gear teeth to housing .....	.0005	to .002 loose	
Journals in housing .....	.0005	to .0015 loose	

Clutch:

Intermedite shaft in flywheel pilot bushing .....	.0005	to .0025 loose	
Driving disc backlash .....	.008	to .010 loose	
Driven disc backlash .....	.004	to .006 loose	
Sliding sleeve bushing on shaft .....	.0015	to .0045 loose	.007
Throwout ball bearing inner race on sliding sleeve .....	.0004	tight to .001 loose	
Throwout ball bearing outer race in cage		line on line to .0018 loose	
Throwout shaft in bushings .....	.002	to .0038 loose	.006

Transmission, Brakes and Steering:

Transmission gear backlash004	to .006	
Intermediate shaft gear ball bearing outer race in retainer		line on line to .0008 loose	
Sliding gear shaft front ball bearing inner race on shaft .....	.0002	tight to .0008 loose	
Sliding gear shaft front ball bearing outer race in gear .....	.0003	to .0019 loose	
Countershaft front ball bearing inner race on shaft .....	.0001	to .002 loose	
Countershaft front ball bearing outer race in retainer .....	.0003	to .002 loose	
Countershaft rear ball bearing inner race on shaft .....	.0002	tight to .0008 loose	
Countershaft rear ball bearing outer race in housing .....	.0005	to .0022 loose	
Countershaft end clearance .....	.003	to .005 loose	
Reverse idler gear bushing on shaft .....	.001	to .003 loose	.005
Reverse idler gear end clearance .....	.003	to .009 loose	.012
Brake pedal spacer on bracket—Radial .....	.0005	to .0025 loose	.006
Clutch pedal shaft in bracket—Radial .....	.001	to .005 loose	.008
Hand brake lever bushing on stud—Radial .....	.001	to .005 loose	.008
Gear shifter lever ball in block .....	.0005	to .0025 loose	.005
Steering ball arm in flanged sleeve bushings .....	.001	to .004 loose	.005

Brake Intermediate Shaft Hanger:

Hand brake shaft in hanger bearing—			
Radial .....	.0005	to .0035 loose	.006
End .....	.001	to .003 loose	.004
Foot brake shaft in hand brake shaft bearing—			
Radial .....	.0005	to .0035 loose	.006
End .....	.001	to .003 loose	.004

(Continued from page 37)

has been operated for two years or more, the valve guides are worn to the extent of fifteen thousandths of an inch diametrically. The valve stems show less than three thousandths wear.

Discussion—Will the cost of new valves, with oversize stems, and the labor cost of reaming old guides be more or less than the cost of new valve guides and the labor of installing them. Under ordinary circumstances the average repair shop would be inclined to choose the reaming of the old guides. It will be

found on some engines however, that the valve guide installation would be the lowest priced operation.

The same holds true on some of the major operations. For instance: does the regrinding of a crankshaft and the purchase of special undersize bearing bushings cost less than a new crankshaft which will allow use of the old bearings? A similar problem arises in the consideration of cylinder reconditioning, etc.

Taken individually any discrepancy in cost between either one, of two methods of reconditioning a part will show per-

haps, only a small increase or decrease for the job. However, when the work done on the car involves several UNITS, the sum of these increases or decreases may spell the difference between loss and profit. From another angle they may destroy the goodwill of the public regarding the repairing of cars as a business.

There is no good reason why Maintenance Merchandising Research, of which Cost Figures and Maintenance Specifications are an integral part, should not be given the study and attention of New Car Sales Research. In the final analysis Maintenance Merchandising Research will be found non-conflicting with New Car Sales Research.

A proof of the above statement can be seen in any town where invariably the car with the best Maintenance representation is also the car which has been most profitable from a dealer sales standpoint. The quality and cost of the maintenance on any car, regardless of whether it has been maintained by car dealer or independent, has a distinct reaction on the territorial sales possibilities of that car.

Excessively high prices for repair parts, inaccessibility of the product, and a lack of anything approaching standard maintenance methods are three items worthy of executive consideration. Wherever and whenever this consideration is given it will involve a closer study of Flat Rate.

The Use of Classified Advertising

IN a paper read recently, before the Motor Truck Advertising Managers of the N. A. C. C., Robert F. Wood, advertising manager of the Autocar Company gave a very concise definition of the classified newspaper ad. He said, "The classified advertising columns of a newspaper are a highly specialized and the most completely standardized form of advertising now in existence.

"The preparation of copy for these columns, however, is exactly as important as the preparation of display copy. It would not be going too far to say that it is a much more important operation. The writer must depend wholly upon his ability as a salesman to tell his story in the classified ad. There is no special type, no white space to be used to set off any particular statement. Therefore, its preparation must be dealt with carefully.

"The story must be complete, to begin with. Chopping off the words or shortening the text destroys reader interest. A complete and clearly written ad, giving all of the details and the price of the article for sale, will get the attention of the classified ad reader and hold it. The people who read the classified ads of newspapers, turn to them because they are interested in some particular thing. In the case of the automobile, every reader is a potential buyer and, of course, the best salesman, will get the reward.

"The thing to be remembered in classified ad preparation is to be careful and tell the story, complete."

MOTOR AGE

Reg. U. S. Pat. Off.

Vol. XLV

Thursday, January 3, 1924

No. 1

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 Tom Wilder

J. E. Schipper, Field Editor
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Christmas Selling

A REPRESENTATIVE of MOTOR AGE visited a dozen accessory stores and asked them if the Christmas selling campaign had been a good thing. All of them said yes. In the list of places visited were jobbers, department stores and retail accessory stores of varying size.

The department stores reported that they had sold out on Christmas package accessories a week before Christmas in practically everything except cold weather goods, such as radiator covers, shutters and the like.

The jobbers said that they had cleaned up well on holiday packages and had noted a considerable increase in trade which they attributed to the Christmas suggestion. While they had not had reports in detail from dealers, they thought from such reports as received that the dealers had cleaned up pretty well.

The retail dealers did not fare as well, apparently, as the department stores but they had done a business ahead of expectations. It is only natural that the specialty dealer in this line should not be able to cope with the department store this year, because the department store habit is so strongly entrenched in the minds of gift buyers. A change will come in time, if the good work is continued.

Calls on an almost equal number of car dealers brought four replies that no cars were sold for Christ-

mas. At one place, they apparently had not thought about it. One dealer sold four cars for Christmas and one exclusive used car dealer sold a car for Christmas morning delivery.

The Christmas gift selling campaign is making headway and if the car dealers will catch the spirit they, too, can participate.



And now to start fresh on another year.



Associations

WITHIN the next few months a majority of the automotive dealer associations will have accomplished the one big job of the year that has for so long been regarded as the one thing which justified the existence of the association—staged the annual show. Also in the past, the success of this show has been judged to a very considerable extent by the number of paid admissions.

We have watched closely, recently, the progress of several dealer associations and we find that the thoughtful members of these associations regard the annual show as one of the minor activities—that the association does the most good for its members in the promotion of good will and profit intelligence among the dealers. It is a fact that one wild trader in a community can cause losses to his fellow merchants that will more than offset the profits from the show.

A wild trader is a very great power for loss. He not only loses his own profits but he takes from other dealers sales that would have been profitable to them and turns them into losses for himself. The dealer who regards himself without a used car problem because he is making money on his used cars, is not admitting the truth to himself. Every sale he loses to a wild trader constitutes a used car loss for him.

And so we say that if the association can bring these automotive merchants who are doing business at a loss into their membership and teach them the necessity of profit, the association will justify itself. This is only one field of usefulness and we hope that members of automotive dealer associations will endeavor during 1924 to see how much good they can get from their organization. If the member does not want benefit, he will not get it, as an association cannot be any greater than the desire of its members.



"A higher score in '24."



What Is a Merchant?

OUR attention has been called to an editorial in a merchandising magazine in another line of goods which suggests that every dealer should consider himself rather as a purchasing agent for his community than as a distributor for a factory.

This is a good phrase, for a merchant must depend upon his customers for his continued trade and for his profit rather than on the factory. The suggestion fits into any sort of a mercantile establishment. If a man is going to become a vehicle dealer, his choice must be made when he accepts a dealership in the line of vehicles. He should consider this line carefully, thinking well as to whether this is the sort of a vehicle that

he believes the people of the community should have. If the car is worthy and fits into the economic scheme of the community, then he should go ahead.

He should sell these cars to customers into whose scheme of things they fit. It is always bad business to sell a man a car that does not fit his means or social position.

This responsibility fits more closely the accessory departments of the automotive business. Many trinkets appear which have little or no economic value. It should be the pleasure of the dealer to keep silly things out of his community and to protect his friends from foolish expenditures.

When a merchant does this, he is really functioning as a purchasing agent for his community. The purchasing agent for a factory guards faithfully the pocketbook of the stockholders. The dealer can do the same for the community.



Get ready now to handle spring service.



Traffic

THE best traffic conditions will simply be those that make for a safe and speedy traffic. Speedy, of course, is a relative word. Speedy in this sense means as fast as conditions will allow, not 30 or 40 miles an hour.

It is evident to any one who watches traffic closely that much of the trouble today is due to ignorant and selfish drivers. This is regrettable, but true. It was just as true during the days of horse traffic and there were congestions then in some places and the people in those days thought that these congestions were serious. The cure for this cause of the traffic congestion is to get as much information as possible to the drivers.

For a number of years this has been attempted by series of don'ts, usually gotten out by the publicity manager of manufacturing concerns and printed in the newspapers. Probably these did some good but the negative method of instruction is never the best. Besides there are so many sets of "Don'ts", and they do not agree, that they become confusing.

There are things that the newspaper can do that will bear fruit. Below are three items clipped from one issue of an Iowa newspaper. Each has its constructive point. They read:

CENTERVILLE, S. D., Dec. 18.—Special: Bennie Stevens, son of Hiram Stevens, sustained serious internal injuries besides a broken pelvis when he drove his truck into the ditch in order to avoid hitting another car stalled at the side of the road while the driver was trying to remedy some trouble he was having. The accident occurred early Sunday morning and might have been avoided had Mr. Stevens' lights been working.

PIPESTONE, Minn., Dec. 18.—Special: Because a jury in the municipal court here believed that Ed Wold failed to give August Johannsen his share of the road when the cars of the two men met three miles south of here on the night of October 13, damages to the amount of \$125 were awarded Johannsen.

Wold, it was alleged, was driving in the center of the roadway and collided with Johannsen's car as the machines were passing. The Johannsen car was badly damaged and its occupants were injured, one member of the Johannsen family being hurled through the top of the sedan by the impact. The case was the first of the kind ever brought into court here.

KIMBALL, S. D., Dec. 18.—Special: Friends of Fred A. Reynolds, real estate dealer of this city, are boasting that Mr. Reynolds, who is more than 70 years old, has been driving an automobile for the past 15 years and has never had an accident. Mr. Reynolds, in speaking of his record, ascribed it to careful and conscientious driving. A little of the "common sense" that is

so rare," Mr. Reynolds asserts, will enable anyone to drive a car without mishap.

The Sioux City Journal's Safe Drivers' club has been heartily indorsed by the veteran motorist who believes that the spirit it would inculcate will go far toward eliminating tragedy.

If more newspapers could be induced to report this sort of information, it would be a strong influence in the education of the motorist. The driver we want to reach is just the kind that never reads the columns intended for him to read but he possibly would read mere news items and a suggestion there might bring home a thought to him.

In the first item you will note that defective lights were said to be the cause of the accident and in this case the man hurt was the one who neglected the lights. In the second case the road hog was forced to pay the damage caused by his selfishness. In the third item, the man with a long safety record says common sense is the best preventive of accidents. We will all agree with him.

Perhaps dealers' safety committees could do a very excellent work on behalf of better traffic if they would devote some educational work to the newspaper editor, getting him to see the constructive possibilities. Newspaper men are very educatable, they are always seeking means for doing good but they have so many things to think about in the course of the day that they cannot go deeply into the study of every phase of the modern life and they welcome suggestions.



Resolved—To make this a transportation store.



5 Per Cent in 1924

SLOGANS are interesting and often useful. C. E. Gambill, vice president of the N. A. D. A., in a bulletin issued by that organization, suggests that every automotive vehicle dealer set himself in the determination to make a profit of 5 per cent on gross turnover in 1924. It is a matter of record that few dealers can show that they have made any such a profit as this in past transactions but they are entitled to this much for themselves. As a matter of fact, in the past, dealers have been considered quite successful if they made a net of 2 per cent on their turnover.

Gambill, who has been an automotive dealer for 18 years, adds to his recommendation that this percentage cannot be gained by the dealer if he devotes his efforts alone to the sale of new cars, that he must get the profits that go with the aftermarket and on the sale of those things which the owner can and should buy at the time he buys the car.

The car has not yet been made and we do not expect that it will be made within the next few years that will be taken from the shop and run over a period of years with no expense except oil and gasoline. As a matter of fact, the car owner has been taught that his great expense was gasoline, when that was not the case at all. If the dealer does not want to sell gasoline to his owners, that is his business, but he should sell most of the other supplies. One test of a dealer's business ability should be based on the number of car sales that made regular customers for tires, oil, accessories, maintenance and other items that are required for the vehicle, for his establishment. All of these things, properly handled, will make profits. The buyer of a car in 1923 should be a prospect for many smaller sales in 1924.

Year's Production Exceeds 4,000,000

N. A. C. C. Figures Show 50 Per Cent Increase for 1923

Passenger Car Output 3,644,000 of Which 35 Per Cent Were Enclosed—370,000 Trucks

NEW YORK, Jan. 1.—Preliminary facts and figures of the automobile industry for 1923 as issued by Alfred Reeves, general manager of the National Automobile Chamber of Commerce, estimated the year's production at 4,014,000, of which 3,644,000 are passenger cars and 370,000 trucks. This compares with 1922's total of 2,659,064 and is an increase of 50 per cent. Of this total, 1,235,000 are estimated to have been closed cars, this being 35 per cent of the total output.

The total wholesale value of the passenger cars is estimated at \$2,243,385,000 and of the trucks as \$267,500,000, or a combined value of \$2,510,885,000. The average retail price of the 1923 passenger car was \$811 and of the truck \$1080.

Touching on allied industries, General Manager Reeves estimates that the tire maker produced 45,000,000 casings and that the wholesale value of the tire business was \$760,000,000. The wholesale value of parts and accessories exclusive of tires, is placed at \$310,000,000.

These figures show that the manufacture of automobiles ranks as a billion dollar industry, for the total of the three branches, cars and trucks, tires and parts and accessories, makes the grand total of \$4,570,000,000.

Other interesting facts given show that 2,750,000 people are employed in motor vehicle and allied lines; that special Federal excise taxes paid to the government by the automobile industry in 1923 amounted to \$155,000,000; that 14,500,000 motor vehicles were registered in the United States this year, of which 12,880,000 were passenger cars and 1,620,000 trucks. The world registration of motor vehicles is estimated at 17,000,000.

It is estimated that 328,333 vehicles were exported from United States factories and Canadian plants owned in the United States. Of these 187,884 were passenger cars and 37,049 trucks. The number of assemblies abroad of American cars was 101,400 and the value of motor vehicles and parts, including engines and tires, was \$234,129,000. Imports of motor vehicles totaled 890.

Taking a census of the retail automobile business, the Chamber finds there are 43,607 car and truck dealers, 50,911 public garages, 67,803 service stations and repair shops and 65,988 supply stores, but many of these are counted in two or more classifications.

Gasoline consumption by motor vehicles in 1923 was 5,404,184,000 gallons, according to the N. A. C. C.

Traffic Violators Must Attend School

MINNEAPOLIS, Dec. 29.—Traffic violators on probation with work-house sentences against them will be ordered to traffic school for a course of one lesson a week for five weeks. Absences will be reported to Judge Levi M. Hall, the traffic judge. The first class, now under way at Dunwoody Institute, numbers 12. M. R. Bass is in charge for Dunwoody and members of the safety bureau of the Civic and Commerce Association will give lessons in driving through the congested district downtown. The instruction is in principles of the traffic code, guiding and handling motor cars, and there is some home study work. A closing oral and written examination will be given on rules of the road, city and state traffic laws, with practical demonstration in driving. Upon the report of instructors the judge will decide whether to lift

OLD TIMERS' BANQUET JAN. 29

CHICAGO, Jan. 1.—The Old Timers' Club, whose membership includes several hundred of the veterans of the automotive industry, will hold its annual banquet in the Gold room of the Congress hotel the evening of Jan. 29, the week of the Chicago automobile show. Harry P. Branstetter, president of the club, said that already more than 100 reservations have been received for the banquet, the main features of which will be a good dinner and high class entertainment, minus speeches.

NASH SALES CONTINUE TO GAIN

KENOSHA, Wis., Jan. 1.—Favorable conditions for automotive progress in 1924 were reported by E. H. McCarty, general sales manager of Nash Motors, upon his recent return from a trip through the northwest, the Pacific Coast region, part of Canada, the southwest, and a portion of the southeast. He stated that west of the Rocky Mountains Nash sales in 1923 were 55 per cent greater than in 1922 and that indications were that they would continue to increase in 1924.

TWO NEW KISSEL MODELS

HARTFORD, Wis., Dec. 29.—Kissel has added two entirely new body models, a Berline-Sedan and a Victoria, and has announced that all models may be fitted with Lockheed four-wheel brakes and balloon tires as optional equipment at an additional cost. The 5-passenger phaeton, tourster, brougham-sedan, coupe and speedster will constitute the balance of the Kissel line.

Akron Club to Erect Statue; Charles Goodyear Memorial

Will Portray Tire Market at Work Over His Kitchen Stove

AKRON, O., Dec. 29.—Action has been taken by the Akron Exchange Club to erect a memorial statue here to Charles Goodyear, whose invention, the vulcanization process for rubber, made Akron the rubber manufacturing center of the world. It is likely that the proposed statue will differ from the conventional in that it will portray Goodyear at work over his kitchen stove, which resulted in his great discovery. This was in 1839 when he was experimenting with rubber and sulphur. Hearing his wife approaching and fearing a scolding for "wasting his time," he threw the rubber and sulphur into the fire. The result showed him the possibilities of vulcanization.

NEW POLICY FOR TEMPLAR

CLEVELAND, Jan. 1.—The Templar Motor Car Co., having been backed by new capital, with a new organization and personnel, has now placed in effect a number of new policies and will very shortly be in production on a new model. The new car will be a six instead of a four as previously made by the old company and many mechanical changes have been made in the design throughout. Four-wheel brakes will be regular equipment, these being equalized in the front axle. The engine will have a seven-bearing crankshaft. Several of the new models are to be exhibited at the New York and Chicago shows at which time a full announcement of mechanical details will be made together with prices.

The new policies include a dealer contract with a number of unique provisions such as a vote in factory affairs, perpetual franchise, protection from loss through price reductions and unused parts, etc. The factory guarantee on a number of parts has been extended in excess of the N. A. C. C. warranty.

SEIBERLING PRODUCTION UP

AKRON, O., Dec. 29.—Seiberling Rubber Co. is reported officially to be operating part of the Barborton plant on a three shift basis and producing in the neighborhood of 1500 tires and 2000 tubes a day. The new production ticket increases a former low mark by between 15 and 25 per cent, according to reliable information. The company as yet has made no plans, as far as is known, to start production in its New Castle (Pa.) plant.

The Calendar of Coming Motor Events will be found on page 57.

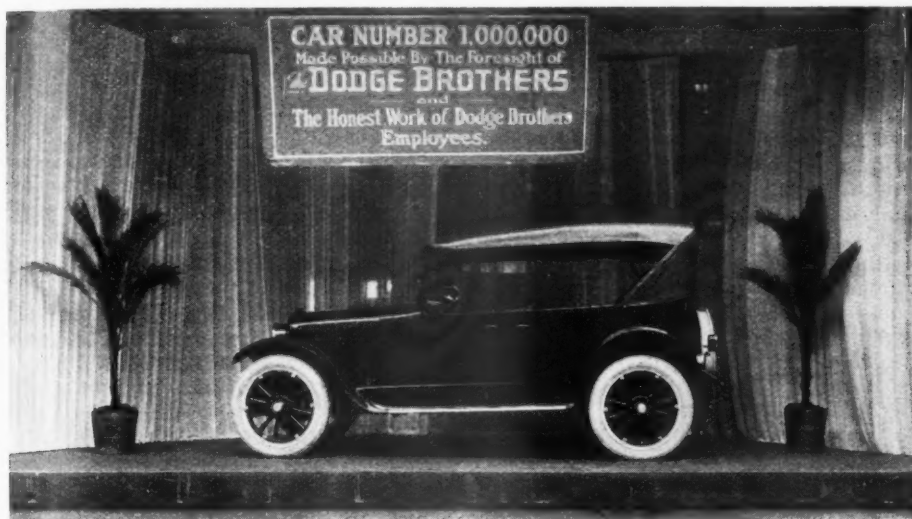
Attention Turns to New York Show

The 1,000,000th Dodge Car

DETROIT, Dec. 29.—Dodge Bros. have completed their first million cars in nine years and eleven days, car No. 1,000,000 having left the assembly line Dec. 13. Of this first million, dating back to Dec. 4, 1914, more than 90 per cent still are in service, a percentage which the factory reports after a careful check. This proof of longevity is really the feature of the

the new assembly plant placed in operation this year plant capacity has been increased to upwards of 1,000 daily.

Considering the number of cars lost through fire and other accidental means yearly, to have 90 per cent in service out of a million cars after nine years, is the point of greatest satisfaction to the company. In almost every city in



manufacturing record, declare executives.

In building the first million within ten years of the start of production, the factory claims a world's record from the time standpoint.

Strong public demand has given constant impetus to Dodge Bros. production from the start, the factory reports. Over-sold at the outset, this condition has continued to now, though the plant has grown from 20 acres of floor space at the outset, to 150 acres at the present time, and employing 20,000 men. With

the United States and in many cities abroad are Dodge cars in operation of 1915 and 1916 production, reports the factory, which have run over 100,000 miles.

Scrupulous care in manufacture alone has made this performance record possible, executives declare. There are innumerable instances in which Dodge Bros. go beyond ordinary manufacturing practices in the effort to produce an exceptional car.

December Sales Slower; Will Register Higher Than in '22

Some Factories Close for Inventory, But a Number Continue at Good Pace

NEW YORK, Dec. 31.—With sales somewhat slower in December than in November and with a number of large producers down for inventory, the output of automobile manufacturing plants experienced a normal curtailment for the month. Those plants not affected by the inventory taking period observed elsewhere maintained good production marks, all employees being at work and no lightening of activities noted.

December will register a higher total than the same month of last year and will round out an extended period during which new production records were made and an unprecedented annual output of motor vehicles was reached. During the period, extending back to March when manufacturing got into full swing, schedules have been maintained at a uniformly high rate. The full year has been one of remarkable achievement, featured by exceptional output and equally exceptional sales.

Stocks have been accumulating slowly both at factories and with dealers, the latter as yet having done but little stocking for spring sales. Beginning in January a general movement on the part of dealers in this direction is expected in order to preclude the possibility of a shortage of cars in the spring. The general keeping up of demand has halted any movement that might have been apparent of an accumulation of stocks for this purpose.

The attention of the industry, generally, is turned toward New York where the first of the National shows will take place during the early part of January. The show will prepare the way for a return to high production marks by all producers and a definite setting forth of schedules for the new year by this manufacturers who have made no announcement up to the time of the show opening.

There will be many new models of cars displayed, some of which have already been placed on public view and others that will be seen for the first time. This annual show, being the first of the important exhibits, has always proved a strong stimulus to renewed buying.

Indicative of the business done by the industry during the year is a report by members of the Motor and Accessory Manufacturers' Association which shows that for the eleven months of this year sales aggregated \$581,985,020, against \$421,324,000 for the full year of 1922.

Affairs of Victor Page Motors Corporation Aired in Court

STAMFORD, Conn., Dec. 29.—Stockholders of the Victor Page Motors Corporation of Stamford expect soon to know what has become of the money derived from the sale of the 5,000,000 shares of the company's stock. Yesterday, United States District Court Judge Edwin S. Thomas ordered an audit of the company's books.

The order was issued in a proceeding brought by Connecticut stockholders representing shares amounting to \$100,000, to have a receiver appointed and the property in Stamford, which is subject to a mortgage of \$50,000, which falls due on Jan. 1, 1924, sold, and the proceeds distributed among the creditors. They allege mismanagement and claim that, although the corporation has been in existence about three years, it has not

yet begun to produce motor cars.

According to counsel for the stockholders the corporation's shares have been sold for from 20 cents to \$3 per share. The corporation was organized under the laws of Delaware, and the par value of shares is \$1. Stockholders said today that the corporation officials admit they have received \$416,000 from stock sales, but claim that this has been spent. The apparent assets today are \$2000 in cash, and the plant and equipment here subject to the mortgage.

Counsel for the corporation claimed at the hearing in Norwalk yesterday that the proceeding is an effort on the part of a group of stockholders to obtain control of the company.

Victor Page, head of the corporation, said the inability of the corporation to produce cars has been a lack of capital due to a "propaganda spread by enemies of the corporation."

Varied Program Announced For N. A. D. A. Convention

Used Cars and Accounting Methods Scheduled for Expert Attention

ST. LOUIS, Jan. 2.—Officials of N. A. D. A. consider the program to be presented at the Chicago convention at La Salle Hotel Jan. 29 and 30 as the most ambitious ever attempted by the Association. The complete program has just been announced from N. A. D. A. headquarters.

Indications are the attendance at the convention this year, which will mark the seventh annual meeting, will be the largest on record.

Production figures as forecast for 1924 and the problems which will confront the dealers and manufacturers in marketing a large increase in the total of new cars produced will be covered by J. H. Collins, manager of the research department of the Chilton Company, Philadelphia. In his analysis for 1924 he will bear on the maintenance departments and the increased costs in the retail selling of motor vehicles. He will review the growth of the demands for repairs and maintenance, and interpret the influence of these things on the automobile dealer establishment.

Charles E. Gambill of Chicago, vice president of N. A. D. A., Hupmobile distributor in Chicago and recognized as one of the few truly successful big merchants in the industry, will discuss the possibilities of a dealer showing a five per cent net profit in the retailing of automobiles. His address is expected to attract much interest.

John A. Nichols, Jr., sales manager of Dodge Brothers, Detroit, will address the convention on the policies which his company has used in building a dealer organization and the efforts that have been put forth to aid and build up the automobile dealers handling Dodge cars.

"Shakespeare as a Salesman" is the subject of the address by William B. Burrus of Kansas City, a sales consultant. It is the application of common every day ideas and impulses to the business of selling merchandise at retail.

The annual banquet and frolic will be held on the night of Tuesday, Jan. 29, in which will be featured G. H. Abercrombie, sales manager of the Fuller Brush Co., Hartford, Conn., on "Building a Sales Organization."

Harry M. Fancher of Denver, Colo., will put before the convention the successful methods of sales analysis, cost analysis and cost finding as made possible by the N. A. D. A. merchandise profits records. The subject of his address will be "N. A. D. A. Records for Dealers' Dollars." This will be the first complete exposition of the N. A. D. A. accounting books and will contain much of essential instruction and fundamentals of keeping accounts and the necessity for them. Fancher is secretary-treasurer of Tom Botterill, Inc., of Denver and

formerly was connected with a nationally known public accountancy firm. He is the designer of the N. A. D. A. record and conducts classes in accounting in the University of Colorado.

The major portion of the time on Tuesday will be devoted to the "Used Car Forum." Complete details of the two national efforts to relieve the used car losses of the automobile dealers will be presented. James E. Appleby of the Percy Chamberlain Associates, Inc., of Detroit, will lay before the convention the full method of the operation known throughout the industry as the "Appleby Plan."

R. J. Schmunk of the R. J. Schmunk Co., Cleveland, Ohio, will discuss the experiences of the Cleveland dealers with the use of the Green Seal used car plan.

The Green Seal plan is essentially identical with the N. A. D. A. Green Seal Used Car merchandising plan which will be presented by Lynn M. Shaw, assistant General Manager of the N. A. D. A., who has been conducting a two year study of used car conditions and who is presenting the N. A. D. A. plan to dealer organizations in a nation wide effort to bring about profitable methods of handling used automobiles. He will review the successful campaign of the last year in which the car losses were reduced approximately \$50,000,000.

R. H. Martin of Atlanta, Ga., Nash distributor, member of the Board of Directors of N. A. D. A., will give to the convention the operations and benefits of the Statistical Bureau as operated by Atlanta Automobile dealers in an effort to arrive at profitable practices in the used car department.

LICENSE COLLECTION ENJOINED

COLUMBUS, O., Jan. 1.—Judge Kinkead in the Franklin County Court has granted a temporary restraining order against collection of license taxes on trucks of more than 30 horsepower. The restraining order is effective until Jan. 7 when the case is to be heard on its merits. Action was on the petition of organized truck operators who claim the new licensing law, greatly increasing fees, is unreasonable. Under the new law five ton trucks would have to pay \$180 a year compared with \$20 last year. Final decision in the case probably will rest with the state supreme court on the constitutionality of the law.

USED CARS NOT ALARMING

LOS ANGELES Jan. 2.—Retail automotive selling conditions continued good throughout December and it is estimated that the month will show a gain of about 20 per cent over the same period last year. Christmas selling was remarkably good dealers paying more attention to the giving of automotive presents than ever before.

The used car situation is not alarming, although practically every dealer is heavily stocked with cars. Optimistic spirit of dealers is evidenced in enlargement of buildings and extension of local subdealer plans. No thought is being given now to spring prospects.

N. T. D. A. to Give Members Data on Supply and Demand

Questionnaire Is Sent to Dealers to Determine Tire Stock on Hand January 1st

NEW YORK, Jan. 2.—The National Tire Dealers' Association is undertaking to gather facts which will give its members information as to the state of supply and demand in the retail tire market from month to month. A questionnaire has been sent to all members of the association asking for the number of tires and tubes on hand Jan. 1.

This information is to be supplied by Jan. 10 and on Jan. 15 the association will send to all members a report based on the compilation of the aggregate figures. Individual figures, of course, will be kept confidential. With that report will go another questionnaire asking for the following information for the month ending Jan. 31:

Inventory—percentage of increase or decrease; sales—percentage of increase or decrease; purchases—percentage of increase or decrease; general business conditions during the month, good, fair or bad; average weather conditions during the month.

Replies to this questionnaire will furnish the basis of another report to go out to all members on Feb. 15, with which will be sent a similar questionnaire for February business. It is proposed to continue this activity month by month throughout the year.

BETTER USED CAR POLICY

COLUMBUS, Jan. 1.—Prospects for business in 1924 are very good, according to the opinions of distributors and agents in Columbus and central Ohio. While there has been a little lull during the holiday period, this is no more marked than usual and all indications point to a good trade in the coming year.

The used car situation shows slight improvement in the past month. Strenuous efforts on the part of salesmen and agents during the holiday season brought about a reduction in the number of used cars on the market. With dealers as a rule following a better policy on aking in used cars the situation is not expected to become more complicated. Optimism prevails on every hand and dealers are preparing for a busy time earlier than usual, especially if the winter continues open as it has been.

NORTHWAY ADOPTS MERGER PLAN

NATICK, Mass., Dec. 27.—At a meeting of the stockholders of the Northway Motors Corporation it was voted to put the merger plan into effect. It is understood that the existing indebtedness of the Northway Motors Corporation will be liquidated and stockholders voting for the merger will exchange their stock for capital stock in the Amalgamated Motors Corporation.

Department Stores, Accessory and Car Dealers Enjoy Unusual Christmas Sales

CHICAGO, Jan. 1.—Sales of accessories in Chicago and surrounding suburbs as Christmas gifts have been exceptional. Cars, too, have sold in many instances but tires were not popular. A number of calls on accessory, and car dealers, department stores and jobbers resulted in the following reports:

No. 1. Department Store, accessory department.—A greater call, by far for accessories this year than last. Mild weather, however, interfered with the sale of seasonal merchandise. So-called novelties comprised the biggest sellers.

No. 2. Department Store, accessories.—We were sold out on a number of the Christmas packages, a week before. Tires did not sell as gifts.

No. 3. Department Store, accessories.—Few of our Christmas packages remain. This department was as crowded as any other during the shopping season.

No. 4. Wholesale and retail accessory store.—An excellent Christmas business rewarded the manufacturers of those products which were "pushed."

No. 5. Wholesale and retail accessory store.—We sold at least one or two of very nearly every item we carry during the Christmas shopping weeks and believe that a great many were for Christmas gifts.

No. 6. Accessory jobber.—While we have not as yet compiled complete figures, we know that Christmas advertising and display did its work.

No. 7. Accessory jobber.—Complete figures are not as yet available but sales were unusually good.

No. 8. Car dealer and distributor.—We delivered a number of cars during Christmas week.

No. 9. Car dealer and distributor.—(High price class).—We sold several new and used cars as gifts.

No. 10. Car dealer and distributor.—No. We did not sell any cars as Christmas gifts. (This is a medium priced car dealer.)

No. 11. Used car dealer.—We delivered one car Christmas morning which was a gift.

No. 12. Car dealer (low and medium priced).—A number of our sales were Christmas gifts.

No. 13. Accessory dealer.—We certainly cannot complain. Our sales were easily twice those of a year ago and it was during the last two weeks of the month that they jumped.

No. 14. Car dealer (medium and high priced).—One used car was sold as a Christmas gift but no new ones were ordered.

No. 15. Accessory dealer.—I was careful to ask people making purchases if they were for Christmas gifts. The majority said "Yes."

No. 16. Car dealer (low, medium and high priced).—We delivered four cars Christmas morning as gifts and many orders were taken for future delivery which were bought as gifts.

No. 17. Car dealer (low and medium priced).—Our sales were good.

No. 18. Accessory dealer.—Women buyers were numerous. They bought many novelties as gifts for men.

No. 20. Car dealer (low priced).—We sold a number of cars and accessories as gifts.

No. 21. Garage and accessory dealer.—We sold many gifts to people who store their cars with us.

No. 22. Car dealer (low priced).—Our accessory sales were exceptional but I doubt if any cars were bought as gifts.

Santa Hangs 600 Per Cent Dividend on Jordan Tree

CLEVELAND, Dec. 29.—Santa Claus came to the Jordan Motor Co. stockholders and presented each with a Christmas gift in the form of a 600 per cent stock dividend.

Stockholders themselves played Santa Claus when they voted at their meeting here Dec. 22 to increase the common stock of the Jordan Co. from 12,000 shares to 200,000, changed the terms of the preferred stock and declared a dividend of 600 per cent on the common stock.

The stockholders also decided to authorize the offering of 42,000 shares to stockholders at \$30 per share. There will be 84,000 shares of stock outstanding after distribution is made in accordance with the stock dividends, so that each stockholder will be given the privilege of subscribing for one-half share of new stock for each share of old that is held.

The balance of 74,000 shares is to remain in the company treasury.

The refinancing is subject to the approval of the department of securities.

President Jordan stated that the proceeds of the sale of stock would be used as a backing for working capital.

A NEW MOON SIX AT \$995

ST. LOUIS, Jan. 1.—Moon is bringing out a new six to be exhibited at the National Shows. It will sell for \$995, the lowest price the Moon has ever sold for. Preliminary models were disclosed to dealers and distributors at a recent convention and complete details will be obtainable when the New York show opens. The new model includes the same units as previous models, including special Continental engine, Delco electrical system, Warner gearset, Borg & Beck clutch and Timken axles. The wheelbase on the new models is 113 in., 2 inches less than on the smaller of the current models. The silvered radiator is retained.

Stevens-Duryea to Stay in the Field, Declares Owen

Auction Sale Simply to Move Old Machinery, Says Official

CHICOPEE FALLS, Mass., Jan. 2.—Following the announcement of a proposed auction of tools and machinery by the Stevens-Duryea Motors, Inc., reports published in daily newspapers gave the impression that this was a preliminary step to selling the entire plant of the company recently acquired by R. M. Owen and his associates, and that the Owen interests had no intention of continuing the manufacture of the Stevens-Duryea car.

"We are in production on the Stevens-Duryea now and have been for some time and we have no intention of quitting the field," said President Ralph R. Owen today. "The auction was for the purpose of disposing of surplus machinery which we did not need following our leasing the Rauch & Lang plant next door, where we will make the Stevens-Duryea cars for ourselves and also build the Rauch & Lang electric for the Rauch & Lang company. The Rauch & Lang plant is well equipped with machinery itself, so in moving into the new place we naturally found ourselves with more machinery than we needed, so we auctioned off some of the machinery in the old plant that we did not need.

"The Stevens-Duryea car is distinctly in the market and will remain there. Sales Manager Ray Middleton is building up an efficient scheme of distribution and making many dealer appointments."

Compulsory Insurance Law Being Drafted by Committee

PITTSBURGH, Jan. 1.—Beginning with the first of January, a Pennsylvania legislative commission will make a study of the question of whether the state shall compel automobile owners to take out liability insurance for the protection of those injured due to unlawful, careless or reckless operation of motor vehicles. The study was authorized under the terms of a resolution passed at the last legislative session. In addition to three representatives and two senators, three members have been appointed by the governor consisting of Attorney General Woodruff, Secretary of Highways Wright and Insurance Commissioner McCullough.

Representative Samuel J. McKim of Pittsburgh, a member of the commission, said first consideration would be given to laws of this type enacted in other states.

Following the study, the commission will draft compulsory liability insurance laws suitable for Pennsylvania and present them to the Legislature at its 1925 session.

Many Important Meetings Scheduled for Show Week

Banquets, Luncheons and Dinners on the Program—Exhibitors Will Do Much Entertaining

NEW YORK, Jan. 2.—Show week promises to be a busy time in this vicinity. With more than the usual number of important meetings scheduled, coupled with holding the show itself in the huge Bronx Armory at Jerome avenue and 193rd street, the industry is prepared for all kinds of excitement from the time the show opens next Saturday afternoon until it closes on the night of the 12th.

Preliminary guns will be fired Friday night with a dinner given by the Bronx Automobile Dealers' Association at the Concord Plaza Hotel, which will be attended by such dignitaries as Samuel A. Miles, George M. Graham and others, and a "motor rodeo" dinner given at the Plaza by the Highways and Traffic Planning and Safety Committees of the National Automobile Chamber of Commerce. This will be for editors of general magazines and special writers and will be built around the good roads cause.

During the week of the show itself there will be many important meetings held. The N. A. C. C. alone has scheduled sessions for its Highway Transport, Foreign Trade, Traffic Planning and Safety, Taxation, and Motor Truck committees, and the directors also will hold their monthly meeting. The truck makers will be much in the limelight on Monday, when there will be an all day session devoted to discussion of matters particularly interesting to this branch of the industry. The climax will come on Thursday when there will be a joint meeting at N. A. C. C. headquarters of the Motor and Accessory Manufacturers' Association, National Automobile Chamber of Commerce, National Automobile Dealers' Association, American Automobile Association and the Rubber Association of America.

There will be the usual dinners, starting with the banquet of the Rubber association on Monday night. The N. A. C. C. has scheduled its dinner for Tuesday night at the Commodore and on Wednesday the Motor and Accessory Manufacturers' Association will hold forth at the Astor. Although the annual meeting of the Society of Automotive Engineers will not be held here during show week, the Society intends holding a dinner just the same, Thursday night at the Astor.

There will be the usual number of luncheons and dinners given by the exhibitors, also, and another feature of the week will be a big meeting of the National Automobile Dealers' Association, who will hold a New York session for the first time. The Automotive Electrical Association also will meet here.

All of the complete car exhibits at the show will be on one floor, together with a majority of the 225 exhibits of accessories, the overflow of the latter being placed on the east side of the balcony.

Schedule of Events for Show Week at New York

NEW YORK, Jan. 2.—Events taking place during the national show week in New York are announced as follows:

Jan. 5-12—National automobile show, Bronx Armory

Friday, Jan. 4

10:00 A. M.—National Automobile Chamber of Commerce Highway Transport Committee meeting, Yale Club.

7:00 P. M.—"Motor Rodeo" Dinner given by N. A. C. C. Highways and Traffic Planning and Safety Committees, Hotel Plaza.

7:00 P. M.—Show dinner given by Bronx Automobile Dealers' Association, Concord Plaza Hotel.

Saturday, Jan. 5

10:00 A. M.—N. A. C. C. Highway Transport Committee meeting, Yale Club. Annual meeting of Automotive Electric Association.

2:30 P. M.—National automobile show opens.

Monday, Jan. 7

10:00 A. M.—Convention of all motor truck manufacturers, N. A. C. C. headquarters.

1:00 P. M.—Ward M. Cannaday press luncheon, Hotel Biltmore.

1:00 P. M.—American Automobile Association luncheon and meeting, Hotel Biltmore.

2:00 P. M.—Annual meeting Rubber Association of America, Astor Gallery, Waldorf-Astoria.

7:00 P. M.—Annual Banquet of Rubber Association of America, Waldorf-Astoria.

7:00 P. M.—Peerless Motor Car Co. dinner, Hotel Astor.

Tuesday, Jan. 8

10:00 A. M.—Meeting of United States Automotive Division with contact members of foreign trade committees, N. A. C. C. headquarters.

10:00 A. M.—National Automobile Chamber of Commerce directors' meeting.

12:30 P. M.—Chilton Co. luncheon, Commodore.

2:00 P. M.—Directors of National Automobile Chamber of Commerce attend Chilton Presentation at Commodore Hotel, to hear address on "Present Status of Automobile Industry," with charts by J. H. Collins of the Chilton and Class Journal companies.

6:00 P. M.—Dinner and entertainment for electrical service station operators in eastern district by the electric equipment manufacturers, Automobile Club of America.

6:30 P. M.—Annual N. A. C. C. banquet, Commodore.

Meeting of Pierce-Arrow Motor Car Co. all day at Biltmore.

Wednesday, Jan. 9

9:30 A. M.—Meeting of Foreign Trade Committee of N. A. C. C. at headquarters.

10:00 A. M.—N. A. C. C. export managers' convention at N. A. C. C. headquarters.

10:00 A. M.—N. A. C. C. Traffic Planning and Safety Committee meeting at headquarters.

10:00 A. M.—1 P. M.—Society of Automotive Engineers' meeting and luncheon, Commodore.

12:00 Noon—Oakland Motor Car Co. luncheon, Commodore.

12:30 P. M.—Franklin Automobile Co. luncheon, Commodore.

12:30 P. M.—Auburn Motor Co. meeting and luncheon, Biltmore.

1:00 P. M.—Automobile Body Builders' Association meeting, Waldorf-Astoria.

6:00 P. M.—Oldsmobile Co. of New York dinner at Commodore.

6:30 P. M.—Annual banquet of Motor and Accessory Manufacturers' Association, Hotel Astor.

7:00 P. M.—Cadillac Motor Car Co.'s distributors' dinner, Hotel Astor.

7:00 P. M.—Oakland Motor Co. dinner, Biltmore.

7:00 P. M.—Chevrolet Motor Co. dinner, Commodore.

7:00 P. M.—Willys-Overland Co. dinner, Biltmore.

Thursday, Jan. 10

9:30 A. M.—National Automobile Dealers' Assn. meeting, Commodore.

2:00 P. M.—N. A. C. C. Taxation Committee meeting at N. A. C. C. headquarters.

3:00 P. M.—Joint meeting at National Automobile Chamber of Commerce with Motor and Accessory Manufacturers' Association, National Automobile Dealers' Association and Rubber Association of America at N. A. C. C. headquarters.

12:00 Noon—Stutz Motor Car Co. of America luncheon, Commodore.

12:00 Noon—Rickenbacker Motor Co. luncheon, Commodore.

12:00 Noon—Buick Motor Co. luncheon, Commodore.

6:30 P. M.—Society of Automotive Engineers' dinner, Hotel Astor.

6:30 P. M.—Hupp Motor Car Corp. dealers' dinner, Commodore.

7:00 P. M.—First annual dinner of the Overseas Club of the Automotive Boosters' International, Hotel Empire.

7:00 P. M.—Studebaker Corp. dinner at Hotel Plaza.

7:00 P. M.—Paige-Detroit Motor Car Co. dinner, Commodore.

Dodge Brothers will not give a formal dealers' dinner, but will hold daily luncheons at the Pennsylvania Hotel.

This will be the first one-floor display of complete cars since the industry was in its infancy.

The cars to be exhibited are:

American, Anderson, Apperson, Auburn, Barley, Buick, Cadillac, Case, Chalmers, Chandler, Chevrolet, Cleveland, Cole, Collins, Columbia, Davis, Dodge, Dort, du Pont, Durant, Elcar, Elgin, Essex, Flint, Franklin, Gardner, Gray, H. C. S., Haynes, Hudson, Hupmobile, McFarlan, Maxwell, Moon, Nash, National, Marmon, Oakland, Oldsmobile, Overland, Packard, Paige, Peerless, Pierce-Arrow, Premier, R & V, Reo, Rickenbacker, Roamer, Star, Stearns, Stephens, Studebaker, Stutz, Templar, Velie, Westcott, Wills Sainte Claire and Willys-Knight. The taxicabs include Checker, Dodge, Premier, Rauch & Lang, Reo, Roamer and Yellow Cab.

The decorative scheme of the Armory

includes elaborate courts of statuary for individual makes of cars, each court dominated by a statue of the Goddess of Transportation, designed especially for this year's show. The general colors are green and gold, the roof being covered with cream colored bunting in imitation of plaster. The floor is of terra cotta linoleum. At each end of the drill hall, which is 300x600, are paintings 30x60 feet, depicting the contrast between ancient and modern forms of transportation.

S. P. WHITING RESIGNS

DES MOINES, Ia., Dec. 29.—S. P. Whiting, who for two years has been secretary of the motor trades bureau of the chamber of commerce, has resigned to take effect Jan. 15. He will take a position with the Des Moines Register & Tribune where he will be in charge of the automobile advertising.

Ford Predicts Earlier Spring Buying Season

DETROIT, Dec. 31.—The dawning of the New Year sees the automobile coming into a greater era of popularity, declares Ford Motor Co. in statement issued this week. The statement is based upon reports from all sections of the country and upon dealer estimates for 1924. These indicate not only a growing condition of prosperity but a greater tendency toward the use of the automobile both as a passenger carrying vehicle and for commercial haulage.

Spring buying is expected by the company to start earlier than in previous years and as a result the customary car shortage period is expected to come several weeks earlier than previously.

Dull Close for Best Year in Industry for Chicago

CHICAGO, Dec. 29.—Although the year just coming to a close has been by far the best in the history of the automotive industry for the retail dealers in Chicago the last week has witnessed a falling off to the low point of the year. Since Christmas new car sales have slowed up and as to the used car market, there is no such thing.

Many dealers have been making intense efforts to move large stocks of used cars without much success. The common gossip in the trade is that the buyer with cash can get almost any kind of car he wants at his own price. Owing to the extremely demoralized condition of the used car market there has been some increase in the number of foreclosures on cars sold on time, some owners feeling that they will come out better by cancelling future payments and purchasing a used car.

Dealers in the more popular lines of cars agree, however, that sales right up to the present have been considerably better than for the corresponding period last year despite the fact that they have fallen off greatly from two or three months ago.

There is a feeling that the new year will be as good or better than the year just closing. January is not expected to show much improvement, but preparations for spring business are based on the expectation that pocketbooks will loosen up after the Chicago show which will close Feb. 2.

DELLING STEAM CAR

PHILADELPHIA, Jan. 1.—E. H. Delling, at one time designer for Mercer and also connected with the engineering department of the Stanley steamer, heads the Delling Motors Co., 2401-2415 Chestnut Street, which is bringing out a steam car to operate on kerosene or gasoline. The price of the new car is \$2,500 and production is expected to start soon in a plant in Camden, N. J.

Demand for Balloon Tires Presents Factory Difficulty

AKRON, O., Jan. 1.—Demand for new balloon tires is becoming so great that several companies are finding it difficult with the small amount of balloon tire equipment to meet the demand.

On the other hand, equipment makers, still operating with reduced forces, are finding it almost impossible to supply the demand for new cores and molds as rapidly as the tire makers are asking that they be delivered.

According to all present indications the rubber industry will have to spend millions of dollars preparing for the constantly increasing demand for this type of tires.

BOYCE IN NEW BUSINESS

NEW YORK, Dec. 29.—Harrison H. Boyce has retired as general manager of the Moto-Meter Co., Inc., being succeeded by Earle V. Hennecke, who has been general sales manager for a number of years.

In resigning the active management of the Moto-Meter company, Mr. Boyce does so in order to devote his time to the promotion of his new product, Boyce-ite, made by Boyce & Veeder, Inc., of which company he is president. He still retains his interest in the Moto-Meter company. Identified with him in Boyce-ite as secretary-treasurer is Paul L. Veeder, also interested in the Moto-Meter company.

At present Boyce-ite is being manufactured in a small plant in Long Island City, but on Jan. 15 the company will start operations in a new factory at Farmingdale, L. I., which will have a capacity of 30,000 cans of fuel ingredient an hour.

The automotive industry is familiar with the history of the Moto-meter, the invention of Mr. Boyce, who, with George H. Townsend, founded the company in 1912 to manufacture this heat-recording device. With Mr. Townsend as president and Mr. Boyce as general manager, the company struggled hard in its early days to secure recognition, meeting with opposition at first from automobile clubs which claimed that the proper place for displaying their emblems was on the radiator cap. Boyce and Townsend won over the racing drivers, though, and with their approval of the device came recognition from owners in general until now it is regarded as part of the equipment of the modern motor car.

MASON INCREASES TIRE OUTPUT

AKRON, O.—Jan. 1.—Mason Tire and Rubber Co. will start the new year by placing its Bedford, O., plant, formerly the Owen Tire and Rubber Co., in production with approximately 400 men and women employed, according to official information given out by D. M. Mason, vice president and general manager. The Bedford plant has been idle for several months while the Kent plant has been on a greatly reduced production scale. The company recently placed its fabric mill at Kent into operation on a small scale and production is to be increased after the first of the year.

Buick Plans Greater Production in 1924

By H. H. BASSETT

President, Buick Motor Co.

The well being of the automotive industry has usually paced general conditions of a like nature and I believe this will be the case in 1924.

The many factors upon which the fullest prosperity is contingent seem to be working out in a manner that warrant us to thoroughly believe that 1924 will yield bountiful rewards.

We are backing our confidence in the New Year by preparations looking to an even larger production than our record breaking output of more than 200,000 in 1923.

Best December on Record Is Milwaukee Dealers' Report

MILWAUKEE, Wis., Dec. 31.—Milwaukee dealers made more deliveries of passenger cars this month than in any December on record, and so far as it is possible to determine, sales fell only slightly below the November volume. In fact, while the work of the registrar in the office of the secretary of state at Madison during December is principally a matter of handling applications for the next year's licenses, this year a large number of transfers from old to new cars were made. The average number of such transfers in former years ranged between 400 and 500, while this year the number is estimated at more than 2,000.

Some Milwaukee dealers are carrying unfilled orders into the new year. This, however, refers mainly to the most popular enclosed types, the scarcity of which has not been fully relieved. Dealers have been doing considerable stocking of phaeton and roadster types for several weeks in preparation for an active business which is expected to set in during and after the annual show, Jan. 19-26. In the meantime the expectancy is for a moderately good demand, without the sharp vacuum usually noted between the early part of December and show time.

REMY OCCUPIES NEW PLANT

ANDERSON, Ind., Dec. 29.—The Remy Electric Co., which recently purchased an additional plant from the Arvac Manufacturing Co., of this city, has taken possession and after the first of the year will be in full production. Starting motors will be built exclusively in the new plant, leaving more space available at the main plant for the manufacture of generators, ignition distributors, coils, relays and switches. There now are 3650 men and women on the Remy payroll, and the recent acquisition adds 85,000 feet of floor space and ten acres of ground to its capacity. The main plant comprises more than 455,000 square feet of floor space, covering eight acres of land.

Chicago Dealers Hang Up \$2400 Prizes for Salesmen

Trade Association Announces Contest for Best Essays Based on Sales Experiences

CHICAGO, Dec. 29.—Cash prizes totaling \$2400 will be awarded to the winners in an essay contest for salesmen which will be conducted by the Chicago Automobile Trade Association and brought to a close with a banquet just before the opening of the Chicago automobile show.

The contest will be open only to salesmen employed by members of the trade association who to enter the contest must write an essay on one or more of the following topics: How I secure my prospects; How I follow up my prospects; How I handle a prospect with a used car to trade in; How I present and demonstrate my product; How I treat the competitors' products; The most clever sale I ever made.

There will be a first, second and third prize in each one of these seven classes, the total of which will amount to \$2100. The seven first prize winners then will be eligible to compete for a grand prize of \$300 which will be awarded at a banquet the evening of Jan. 23. The contestants for the grand prize will be required to read or recite their essays at the banquet and the winner will be determined by the ballots of the audience composed of the dealers and their salesmen. Some details of the contest have not yet been determined.

One of the main purposes of the contest is to arouse interest and enthusiasm among the salesmen in advance of the automobile show which is expected to mark the opening of an intensive selling season.

Hertz Arranges For Yellow Cab Invasion of Europe

CHICAGO, Dec. 29.—John Hertz, head of the various Yellow Cab enterprises, who returned last week from Europe, stated today that as a result of his trip definite arrangements have been completed for the shipment of the first orders of Yellow cabs to Europe. He said that within 90 days he expected to have 40 to 50 cabs in operation in large cities in Europe. The operation of these cabs will be largely experimental, he said, for the purpose of determining the course to be pursued hereafter in introducing the Chicago built cabs throughout Europe.

London and Paris are to be the testing grounds in Europe for the Yellow cabs, Hertz says, but they will also be introduced in Madrid, Lisbon, Copenhagen and other large cities. As a preliminary step operating companies were organized in Paris and London some months ago to operate Yellow cabs.

Looking over the automotive industry in Europe, Hertz found the larger French

manufacturers operating at capacity with many orders awaiting delivery. He found a growing demand for high grade American cars which he learned were widely considered equal or superior to the best continental products. It was his opinion that the cheaper American cars are declining in popular favor in France and England.

May Establish Road Research Bureau

WASHINGTON, Dec. 28.—Road building and highway construction in the United States will be placed on a more permanent basis if the proposal of the U. S. Bureau of Public Roads for the establishment of a special bureau for research is provided for in the annual budget by Congress.

Estimates submitted this week in the budget ask for \$73,700 for the Bureau to be used in investigating the best methods of road making, their use, and the result of automotive traffic over them and for the use of local materials in their construction. A total of \$481,875 is asked by the Department of Agriculture for the use of the Bureau of Public Roads for the 1925 fiscal year.

EXHIBIT OF FORD ACCESSORIES

NEW YORK, Jan. 1.—Plans have just been completed for a Ford Accessory Manufacturers Permanent Exposition which will open Jan. 5 at 250 West 54th St., New York City. This is being developed for the co-operative display of Ford accessories of various manufacturers throughout the country and will provide Eastern headquarters that will serve the public, the dealer, the jobber and the exporter as a definite medium to locate Ford accessories they may be interested in, and that may be called on display, and obtain the names and addresses of manufacturers or local distributors from whom the specialties can be bought.

It is expected that the number of exhibits will run up to about 300 when the exposition will be in full swing.

RICKENBACKER PRICE CHANGES

DETROIT, Mich., Dec. 29.—The Rickenbacker Motor Car Co. has announced the prices of its 1924 cars. Four wheel brakes will now be fitted as standard equipment on all models.

The following table shows the old and new prices:

	Old	New
Sport Roadster	\$1685	\$1645
Sport Phaeton	1635	1595
4-Passenger Coupe	1885	2035
5-Passenger Sedan	1985	2135

HOOSIERS GOING TO SHOW

INDIANAPOLIS, Dec. 29.—The Indiana Automotive Manufacturers' Association special train to the New York Show is to leave Indianapolis Jan. 3. Indications are that at least eight cars will be occupied by members of the organization and their employees and representatives.

N. A. C. C. Will Entertain Editors at "Rodeo" Jan. 4

Theme Will Be President Coolidge's Statement on Value of Highway Expenditures

NEW YORK, Dec. 29.—Invitations have been sent by the National Automobile Chamber of Commerce to editors of general magazines and special writers to attend its "motor rodeo" which will be held at the Plaza Hotel Friday evening, Jan. 4. In reality this will be a good roads dinner which will be handled by two of the Chamber's committees—Highways of which Roy D. Chapin is chairman, and Traffic Planning and Safety, whose leader is George M. Graham.

Chapin will serve as chairman of the dinner, the guest of honor being Thomas H. MacDonald, chief of the United States Bureau of Public Roads.

The dinner is built around President Coolidge's statement to Congress that "no expenditure of public money contributes so much to the national wealth as for building roads."

"What this expenditure totals, how it should be raised, what progress is being made, how highway traffic may be made safer, what relation the highway program has to national well being are among the questions we shall attempt to lasso and corral, hence the term 'the motor rodeo' dinner," says the Chamber in its invitation.

The first showing of the highway transport educational film, which was prepared under the direction of the Highway Education Board, the United States Bureau of Public Roads and the National Automobile Chamber of Commerce by the Ford Motor Co., will be at this dinner. This film shows the effect of good roads on the farm boys' lives.

Free Battery Service Goes, 25-Cent Charge in Portland

PORTLAND, Ore., Dec. 29.—Free battery service, long the rule in Portland, will go into the discard on Jan. 1, when a 25-cent charge will become effective at practically all stations. One battery man established this charge a couple of months ago, and the rest decided to fall in line.

In establishing the service charge the Portland battery men are following the lead of battery men in the other Pacific coast cities. Portland is the last large city on the Pacific coast to give up free service.

MACHINES BUILD TIRES

AKRON, O., Dec. 22.—The commercial operation of a tire building machine which makes at least 65 tires an hour with five men employed has been officially confirmed at the Firestone Tire and Rubber Co., while a machine said to be capable of producing 100 tires in an 8 hour day is reported without confirmation to be in operation at the B. F. Goodrich Co.

Collins Resigns as President and Manager of Peerless Co.

D. A. Burke Elected General Manager, But President's Office Is Not Filled

CLEVELAND, Dec. 29.—The resignations of R. H. Collins, as president and manager, and of his son W. M. Collins, as vice-president and director of Peerless Motor Car Co., were read and accepted at a meeting of directors of the automobile company this week.

D. A. Burke, present vice-president and sales director, was immediately elected general manager. H. C. Robinson, vice-president of the Guardian Savings & Trust Co., was elected a director to fill the vacancy caused by the resignation of W. M. Collins.

An executive committee consisting of Fred R. White, chairman; C. F. Sullivan, president of the Central National Bank, of this city, and H. A. Tremaine, local financier and former holder of the controlling interest in the company, was elected by the board of directors to supervise the management of the business. The board passed a resolution which provides for meetings twice a month, so as to bring them more closely in touch with the operations of the corporation.

Whether Burke, one of the keenest salesmen in the industry in this city, is to remain permanently in charge of the company with the Tremaine interests supporting him, is unknown. It was stated that a successor to Collins has not been named.

The resignations and the creation of the supervising committee will not change production plans for 1924. Work has gone forward in the development of the new six cylinder car, which was devised by Collins while in Detroit and sold by him to Peerless for approximately half a million dollars. This new car will be shown for the first time at the New York show, and the rather ambitious plans for this car will be carried out. It is to be known as the Peerless Six, and under present plans will sell for under \$2000. The eight cylinder Peerless will also be manufactured and sold.

The directors expressed regret that Collins should find it necessary to resign, and the secretary was instructed to express official regrets to Collins and his son, who are in California. Directors expressed gratification over the financial condition of the company and declared the regular quarterly dividend of \$1 per share.

Collins took control of the Peerless company in November, 1921. He purchased 79,662 shares of the stock at \$50 each, enough to give him control. The company's business improved and finally the stock sold up as high as 86. Then it commenced to slide under heavy offerings. That continued for months.

A few weeks ago David Rockwell, who

has been in the investment business, filed suits against Collins. Rockwell claimed to be a minority stockholder and that he was acting in the interest of stockholders, claiming that domination of the board rested absolutely with Collins. He attacked a contract between Collins and the Company in which Collins was to receive a bonus of \$65 on each car manufactured; he asked also for an accounting from Collins on money paid for the purchase of the six cylinder car. After these suits were filed Collins' regime was upheld at a stockholders' meeting, and then Collins offered to resign. He was continued in office. Some weeks ago the Rockwell suits were settled by Collins paying back to Peerless \$150,000. Collins did not accept all of the salary due him on his contract with Peerless.

U. S. to Exhibit Road Plans at Chicago Good Road Show

WASHINGTON, Dec. 29.—The Federal government's past, present and future program of highway construction will be one of the major exhibits at the Chicago Good Road Show to be held on Jan. 14-19, the U. S. Bureau of Public Roads has announced.

The exhibit, in seven parts, briefly shows the story of good roads, what they mean to the country and the progress being made in their construction. The exhibit of the Bureau consists of the following:

(1) The composition model and painting exhibited at the International Exposition in South America, showing construction of gravel road; (2) paintings showing Federal and forest road construction in all sections of the country; (3) a small booth illustrating various activities in the Bureau relating to physical research in road building; (4) small road models illustrating methods of construction; (5) motion pictures illustrating road construction; (6) an enlarged map showing Federal roads now completed, under construction and to be constructed, and (7) a large model and painting showing the services that a road performs in the city, suburbs, and country, and what good roads mean to the city, suburb and country.

RUBBER ASSOCIATION MEETING

NEW YORK, Jan. 1.—The annual meeting of the Rubber Association of America will be held Monday afternoon, Jan. 7, at the Waldorf-Astoria, followed by the annual banquet in the evening. The meeting will elect seven directors who in turn will select the officers for the following year. An innovation this time will be brief talks by leaders of the industry on present conditions in the rubber trade, which will be followed by discussion by the members.

The directors of the Rubber association have paid heed to the request of the National Tire Dealers Association, voiced at the latter's recent annual meeting, and will appoint a sub-committee which will discuss pertinent questions with the dealers.

Heminway Lists 6 Notable Trends of Industry for 1924

M. & A. M. A. Manager Predicts Featuring of Balloon Tires, 4-Wheel Brakes and Complete Equipment

NEW YORK, Jan. 1.—Six trends that are expected to characterize the automotive industry in 1924 in the opinion of leading executives, are summarized today by M. L. Heminway, General Manager of the Motor and Accessory Manufacturers Association. They are based on an exhaustive survey of currey conditions. Here are the dominant conclusions:

1. According to conservative estimates, 1924 production of cars and trucks will probably be about 3,500,000—the largest year in the history of the industry, with the exception of 1923, and 33 per cent above 1922 total which established new high record at that time.

2. Outstanding features at automobile shows will be balloon tires, 4-wheel brakes, moderate priced sixes and completely equipped cars, better lubrication methods and simpler and more efficient transmission and gears.

3. Business and credit conditions fundamentally sound; financial and sales outlook for strong, well-established companies, providing high quality product, particularly bright.

4. Continuation of normal trend in direction of integration and mergers, but in orderly and constructive manner.

5. Development of simplification and standardization in motor vehicle construction, in order to increase efficiency, improve service and enhance convenience and value for automobile user.

6. Encouraging outlook for sale of American vehicles and motor products in foreign fields, particularly Latin American areas, Australian, and parts of the Orient.

OHIO TO REMOVE SNOW

COLUMBUS, O., Dec. 29.—The state highway department is going into the business of snow removal on a large scale during the coming winter, providing the new year is productive of more snow than late 1923. State Highway Commissioner Boulay announced that he is preparing to meet any emergency that might arise by a heavy snowfall, and that he will keep the main avenues of traffic open all winter.

Employees of the highway department in every county have been notified to keep their equipment ready for use, and that in event of a heavy snow to clear as many routes as possible.

BUYS TIRE PLANT

WOOSTER, O., Jan. 1.—The Thomas Rubber Co. has purchased the Wooster plant of the Kelly-Springfield Tire Co., and has moved its general offices and manufacturing activities here from Millersburg, O.

Chrysler Organizes Company to Manufacture His New Car

Also Becomes President of Maxwell Whose Sales Organization Will Market Chrysler Six

DETROIT, Dec. 29.—Walter P. Chrysler has quietly assumed the presidency of the Maxwell Motors Corp., succeeding W. R. Wilson, but no formal announcement of this step will be made. A large part of the administration work of the company will devolve upon the vice-presidents, for which they are well qualified.

Incorporation papers have been filed by the Chrysler Motor Corp. Officers are the same as those of the Maxwell Motor Corp. The new Chrysler car will be manufactured by the Chrysler organization and sold through the Maxwell sales organization although sales will be handled by practically all the present Maxwell dealers. Other outside dealers contracts will probably be made.

Although the new car is now in limited production prices will not be announced until the first day of the New York show and it is thought that two or three months will be required to fulfill dealers requirements of sample cars, consequently distribution to customers will not begin until late winter or early spring.

In addition to the New York show, cars are to be exhibited at all the principal shows.

\$66,140,327 Excise Tax Paid By Motor Buyers in 11 Months

WASHINGTON, Dec. 29.—Excise taxes collected from the automotive industry during the month of November show an increase of \$3,146,904.01, over those of the corresponding month of 1922. Total excise taxes for November of this year, collected from the sale of automobile trucks, automobile passenger cars, motorcycles and automobile accessories amounted to \$13,196,922.44 compared with \$10,050,018.43 for November of last year.

The total excise taxes for the first 11 months of this year, according to figures made public by the Bureau of Internal Revenue, collected from the automotive industry is \$66,140,327.01, compared with \$58,724,627.95, the first 11 months of last year or an increase of \$7,415,699.06.

PACKARD PREPARES NEW SIX

DETROIT, Dec. 29.—Curtailed factory operation in connection with preparations for the advent of its 1924 six-cylinder line is said to be the cause of the Packard Motor Car Co.'s net earnings in the first three months of its fiscal year beginning Sept. 1 being somewhat lower than the corresponding period in 1922. Net for dividends in September, October and November was approximately \$1,250,000, compared with \$2,553,164 in the same period in 1922.

Quarterly net for the company's 1922-

1923 fiscal year averaged \$1,750.00. The balance in the first quarter of the current year, which equals, after preferred dividends over 40 cents a share on the 2,377,000 shares of \$10 par common, compares favorably with the average last year, when the abnormal factory conditions of the past few months in preparing for the new single-six, are taken into consideration.

60 Manufacturers Exhibit at Jobbers' Convention

INDIANAPOLIS, Dec. 28.—The twenty-fifth anniversary of the Gibson Co., wholesale distributor of automotive accessories and garage equipment, was celebrated here this week with a three day accessory show for salesmen, dealers and wholesalers. The show began as a simple exhibit at which some 20 or so manufacturers of accessories and automotive equipment were expected to display their wares and to engage in dealer educational work. The idea caught on and the result was a very large accessory and equipment show occupying the entire second floor of the large Gibson Building, one of the largest automotive buildings of this city with five floors. Instead of 20 exhibitors there were 60 well known factories of the automotive field with displays and trained merchandising men who not only give the best points on their products but train the dealers and salesmen in practical merchandising of these wares.

It was the intention of Joseph M. Bloch, secretary and general manager of the Gibson Co., which he has piloted for about 12 years, to better the convention plan that has been followed in recent years. He believed that an exhibit with chance for the manufacturing exhibitors to talk practical merchandising to his salesmen and visitors, would be better than the best old convention plan. The makers gave such hearty approval to the plan that the exhibit was left far behind and a show of three times the size of the first idea was the result.

LIQUIDATING OGREN ASSETS

MILWAUKEE, Wis., Jan. 1.—Liquidation of the affairs of the Ogren Motor Car Co. of Milwaukee, which for several years manufactured the Ogren Six, but has been inactive for the past six months, is proceeding with the appointment of a receiver by the Milwaukee county circuit court on the petition of the Cleveland (O.) Hardware Co. The Ogren company was organized in 1917 by Hugo W. Ogren, of Chicago, formerly prominent in racing circles, and established a factory at 692-712 National Avenue, Milwaukee, manufacturing a car selling for about \$4,000 in a standard phaeton type. Ogren retired from the company some time ago and returned to Chicago. Most of the machine shop and tool equipment has been sold to the Huffman interests of Elkhart, Ind., which have transferred it to their axle plant at Barton, near West Bend, Wis., which formerly was the works of the Barton Axle Co., defunct.

Independent Shops Show Keen Interest in Flat Rate

Large Attendance at St. Louis Meeting Addressed by Arthur R. Mogge of A. E. A.

ST. LOUIS, Dec. 29.—An address by Arthur R. Mogge of Chicago, merchandising director of the Automotive Equipment Association, was the principal feature of a meeting of the Associated Automobile Service Companies of St. Louis, presided over by Geo. C. Porter, president, at the Marquette Hotel recently. The organization is composed of independent automobile repair establishments throughout the city.

Mogge declared that the automobile men should learn a flat rate lesson from the barbers who charge the same amount for trimming the few hairs possessed by a bald headed man as they do for cutting a luxuriant growth.

Following Mogge's address a discussion of the flat rate systems ensued. J. D. Lazor of the Gravois-Compton Auto Service Co. stated his company had used the Ford flat rate schedule for some time, but another member declared he considered the Ford schedule too low to permit of a reasonable profit to the firm using it.

Geo. H. Niekamp of the Beck & Corbitt Iron Co., who was instrumental in bringing Mogge to the meeting, said that the Ford system contemplated the use of proper machinery by repair shops and that for Ford repairs the apparatus had reached a high state of perfection. He also said the Ford Motor Co. advised its dealers to equip their shops with the latest devices for expeditious and efficient work.

One purpose of the Associated Automobile Service companies is to obtain from automobile distributors in St. Louis a dealer discount on repair parts for the lines of cars they handle. A report from the Trade Relations Committee stated that one dealer was granting such a discount.

4-WHEEL BRAKES FOR TRUCK

ALLENTOWN, Pa., Jan. 1.—The Bethlehem Motors Corporation, manufacturers of The New Bethlehem motor truck, will shortly announce four wheel brakes, as optional equipment on the larger of the Bethlehem models, in addition to that equipment which is now available as optional equipment on The New Bethlehem "Airline" speed truck model. The equipment on the larger models, known as the "Fast Freight" and "Heavy Duty" models, will be similar in design to that used on the "Airline" model with equalization within the axle itself and co-ordination with rear wheel brakes through special Bethlehem design of the brake control pedal. The New Bethlehem front wheel brakes are internal expanding as are rear brakes on all Bethlehem models.

Urges Increase in Funds of U. S. Bureau of Standards

A. A. A. Believes Bureau's Research Work Is of Great Benefit to Motorists

WASHINGTON, Dec. 29.—Believing the research work of the automotive section of the United States Bureau of Standards is of greater value to the automobile industry of the country in proportion to the amount of Federal money expended than any other activity of the government in behalf of motorists, the American Automobile Association is urging Congress to increase the annual appropriation for this work.

A sum of \$15,000 was asked in the budget to carry on the bureau's research in the automotive field. The minimum for this work, the A. A. A. declares, should be \$50,000 annually.

The industry is turning into the Federal treasury more than \$100,000,000 a year, the association points out. The automotive section in the study made for the Motor Transport Corps on behavior of brake lining materials alone made possible the saving of \$10,000,000 annually for the motorists of the nation, cutting the brake lining bill from twenty to ten millions of dollars.

Many of the savings for motorists have been the results of tests conducted for the army, navy and motor transport corps on problems involving aircraft and automobile power plants, fuels, lubricants and accessories. The total expenditure of the automotive section was approximately \$125,000, but none of it available for strictly research work by a special automotive bureau.

The bureau now has under consideration the development of methods for testing the braking ability of automobiles, but is handicapped in its work through the lack of funds. Without the direct support of Congressional appropriations, the association declares, this work cannot be carried on, as there is no outside agency which can support it.

Another project of perhaps equal importance is an investigation to determine what is the most economical grade of motor fuel for use in existing motor vehicles. The results of this research, while not yet completed, indicate the total consumption of motor fuel can be cut some 30 per cent without sacrifice in the mileage. This project promises further economic saving to the public of many millions of dollars in addition to fuel saving to the government itself, which, it is said, would pay many times over for the cost of the entire automotive program of the bureau.

FISK BALANCE SHEET

NEW YORK, Dec. 29.—The balance sheet of the Fisk Rubber Co. for the ten months ending Oct. 31, which now is the end of the company's fiscal year, shows net sales of \$44,862,743, with operating profits after depreciation but before interest of \$3,810,881. After interest and

other charges of \$2,583,613 and setting aside \$500,000 for contingent liabilities prior to 1923, the sum of \$2,083,613 is carried to surplus. This compares with a corresponding period in 1922 with net sales of \$38,516,611, showing an increase of 16.5 per cent and an increase in operating profits of \$1,179,998 or 44 per cent.

The balance sheet shows current assets of \$23,108,455 and current liabilities of \$3,607,560, a ratio of current assets to current liabilities of 6.4 to 1. Inventories are priced at cost or market, whichever is lower, and the cash position materially improved with cash on hand more than sufficient to liquidate all loans payable.

FRANKLIN EMPLOYEES DINED

BOSTON, Dec. 29.—The entire organization of the Franklin Motor Car Co. of Boston, comprising everyone from the porter up, were guests of the proprietors, Otto A. Lawson and Walter R. Bliss, here this evening at a dinner. Following the meal Lawton gave a talk in which he outlined to his employees how it was planned in 1924 to set aside a share of the earnings for them, and he thanked the entire gathering for the spirit in which they worked this year. Mr. Bliss gave a talk on morale and organization, during which he showed how much could be accomplished by everyone working in harmony all trying to do his or her best.

Can't Down Old Man Detour

PORTLAND, Ore., Dec. 28.—No matter how hard you try you can't down "Old Man Detour." As long as there are motorists who motor and highway engineers who build and rebuild roads the detour is bound to bob up now and again to the great dress of motorists.

This was pretty well established this week when "Old Man Detour," a dummy figure thrown to a watery grave in the Columbia river on Oct. 21, last, to celebrate the completion of 750 miles of hard surface pavement from Vancouver, B. C., through Washington and Oregon to the Oregon-California line, was washed ashore on the beach at San Diego, Calif.

The effigy was thrown off the Interstate bridge across the Columbia river a few miles north of Portland, and at the time was heavily weighted with rocks. How the figure could have broken loose from the rocks and floated down the Columbia river 100 miles and out to sea and thence down the Pacific coast nearly 1000 miles in the short space of six weeks is a mystery. The identification at San Diego was made by the daughter of an official of the Automobile Club of Washington, who happened to be motoring along the beach at the time.

It just goes to show that "Old Man Detour" will not down, although the people of California have not given the old fellow a warm welcome and expect to eject him bodily from the state.

Free-for-All 500 Mile Race to Mark French Track Opening

Speedway, Now Under Construction Near Marseilles, Will Open on July 13

PARIS, Dec. 15.—(By mail).—A free-for-all 500-mile race will mark the opening of the first French automobile speedway, now under construction near Marseilles. Paul Bablot, ex-race driver, who is at the head of this organization, is of the opinion that for a long-distance event there is no need for weight, piston displacement or other restrictive rules, and in consequence he has announced the opening track race, for which the date of July 13 has been accorded by the international racing authorities, free to all types of cars, with either one or two men aboard, and with two assistants allowed at the pits.

Entry fees will be refunded to all starters. The winner will receive 100,000 francs cash, the second man 50,000, and the third man home 20,000. In addition there will be a cash prize of 5,000 francs for the leader at each 100 kilometers and if the world's record for 500 miles is beaten the winner will get an additional 20,000 francs. This record at present stands at 94.48 miles an hour, set up by Jimmy Murphy at Indianapolis in 1922.

This year's 122 cubic inch cars are capable of lowering the world's 500 mile record on the Marseilles track, declares Bablot, for the speedway, which is 3.1 miles round, is banked in such a way that the turns can be taken at 130 miles an hour. The straightaways have a width of 52 feet, and instead of being cambered are raised on the outside 25 mm. per metre, or just sufficient to allow water to run off to the inside. This slight banking on the straightways makes it possible to enter the turns, which have a radius of 1,555 feet, almost imperceptibly and without any slackening of speed. The track will be surfaced with 5 inches of concrete on a macadam foundation. Railroad tracks with 5 miles of sidings run to within 50 yards of the main entrance of the speedway; there are three main roads, and eighteen entrance gates will be constructed.

Paul Bablot has taken the initiative of a movement to establish an international association of race track owners in order to secure uniform racing rules, arrange suitable dates for meetings and protect the interests of race promoters. Four big long distance track races are promised in Europe for next season. Following Marseilles on July 13, there will be a race at Brooklands, England, on Aug. 15; a 500-mile race on the Monza track, Italy, on Sept. 15, and a similar race at Sitges, near Barcelona, Spain, on Oct. 15.

FRENCH STRAIGHT SIDE RIMS

PARIS, Dec. 15.—(By mail).—Straight side rims are now being manufactured in France, under Goodyear license, by the Manufacture Francaise des Jantes Metalliques, with a factory in Paris.

BUSINESS NOTES

Richard M. Sheridan & Co. has been formed, with headquarters at 833 Peoples Gas Bldg., Chicago, to represent manufacturers in the sale of automotive equipment to jobbers. The company is already under way, preparing to cover the Middle Western territory on several lines. Richard M. Sheridan, head of the company, recently retired as Middle West representative of the X Laboratories. He had been in the automotive sales field for a number of years. He is president of the recently organized Boosters Club of Chicago.

The annual meeting of stockholders of the National Tire & Rubber Co., East Palestine, O., re-elected the following officers: President, C. L. Merwin; vice-president and general manager, C. E. Miley; treasurer, C. W. Helman; secretary, L. M. Kyes. The company's statement shows an increase in sales of \$500,000, with net profit from operations of \$112,000. Current assets of \$476,192 and current liabilities of \$163,553 are listed.

The United States Auto Twin Hooks and Chain Co., Oakland, Md., has been incorporated with

\$100,000 capital stock to manufacture and sell automobile non-skid tire chains, etc. The incorporators are Charles N. McIntire, Henry C. Sincell and Lawrence K. Dixon.

The Walker Mfg. Co., of Racine, Wis., manufacturer of automobile jacks, gave each of its 300 employees a life insurance policy for Christmas, the amount of the policy varying according to the period of service.

K. & W. Rubber Co., Delaware, O., formerly manufacturer of reliners and the Maxotire, is now manufacturing a special inner tube known as the "Airtank" and also standard gray inner tubes.

The Reo Motor Car Co. will create a new division when it takes over the plant of the Duplex Truck Co. in March to specialize in transportation equipment for individual requirements. Special equipment required for buses, taxicabs, delivery trucks and other vehicles will be made in the new unit and the vehicle furnished complete to the purchaser where formerly he was obliged to have the special equipment made himself.

Portland Dealers Have Eye Open for 1924; Show Feb. 9

PORTLAND, Ore., Dec. 29.—With the year 1923 practically at a close the automobile dealers of Portland are looking forward to the 1924 season, and specifically towards that annual event which ushers in the big buying season, the annual Portland automobile show. The show this year is set for Feb. 9 to 16 and will be held in the city auditorium, the same building which has housed it for several years past.

The month of December, according to the dealers, has been slow, but not more so than was expected, in view of the fact that many buyers hesitate to purchase a car before the end of the year, with the prospect of having to buy a 1923 license for it and then very shortly buy a 1924 license.

January is expected to be an excellent month, with the stimulus provided by this hold-off business of December, and February, with its automobile show, is expected to really usher in the heavy retail season.

TRUCK MAKERS' CONVENTION

NEW YORK, Dec. 29.—A tentative date, Monday, Jan. 7, has been set for a convention of motor truck manufacturers by the National Automobile Chamber of Commerce. The whole day will be given over to the meeting and an interesting card has been arranged by Edward F. Loomis, secretary of the National Motor Truck Committee of the Chamber.

Among the discussions proposed are: "What Can Be Done to Improve the Standard of Truck Paper," "Bus Operation by Electric Railway Companies," "The Pennsylvania Railroad's Experiment in Moving Freight by Motor Truck," "Progress in Building the Nation's Highways," and "Common Carrier Laws and Legislative Problems."

In addition there will be a talk on "Status of the Motor Truck Industry," illustrated with charts, by J. H. Collins of the Chilton and Class Journal companies.

NEW WILLYS CORP. PLAN

TOLEDO, Dec. 27.—Lifting of the receivership of the Willys Corporation is dependent upon the definite settlement of the claims of the Federal government, it was reported to the court here, in connection with the presentation of a readjustment of the affairs of the corporation for protection of the first preferred stockholders.

Under a plan approved jointly by the southern district of New York court and Judge Killits here, a new corporation, to be known as the Landover Holding Corporation, will be incorporated to hold the 150,000 shares of common stock of Willys-Overland Co., given for the benefit of preferred stockholders of the Willys Corporation as part of the consideration for the big block of Overland stock purchased from the receivers by Toledo interests last summer.

PIERCE-ARROW STUDIES LIGHT SIX

BUFFALO, Dec. 29.—Regarding the rumors that the Pierce-Arrow Motor Car Co. is contemplating bringing out a lower priced light six, President Forbes declares that at present the company is not in a position to make a definite announcement regarding its policy in the matter, but that if a light six is put on the market it will in no way affect the present Pierce-Arrow car. His engineers have been studying the production of a light six, he says, just as they review all tendencies in contemporaneous motor car production.

186 MAKERS DEC. 1.

WASHINGTON, Dec. 29.—A total of 186 manufacturing concerns were engaged in the construction of automobiles and trucks in this country on Dec. 1, according to a census report just completed by the United States Census Bureau.

Of this number 96 companies manufactured passenger cars and 119 made trucks, 29 making both passenger cars and trucks. Since the first of the year twelve concerns either went out of business entirely or were absorbed by other automobile manufacturing concerns.

Cars, Like Women's Gowns, Says Court; Grants Damages

Utah House Which Sold Judge 1921 Car for 1922, Loses Case in High Court

SALT LAKE CITY, Dec. 29.—An automobile is like a woman's gown. The value of a 1921 model in a motor car, like a 1921 gown, may be just as good; it may look just as well; it may wear just as well; it may be intrinsically worth as much as a 1922 model of car or gown. But when one purchases a 1922 model of a car, like a woman's purchase of a 1922 gown from a dealer, the model agreed upon must be delivered, and a change in delivery of the car or gown of earlier date than the one contracted for, or if a gown of some previous year's style is substituted for the original purchase, then the purchaser is entitled to damages.

This, in substance, is a ruling of the Utah State Supreme Court in the case of Judge J. W. Stringfellow of this city against the Botterill Automobile Co., ordering a new trial in the case.

Judge Stringfellow stated that he purchased an Essex touring car from the company on Feb. 1, 1922, and entered into a written contract in which the car was described as a 1922 model and that a bill of sale was delivered to him describing the car as a 1922 model. In July, he said, he discovered the machine was a 1921 model. In reply the company denied it had contracted or sold a 1922 model car. The lower court upheld this plea and an appeal was taken by the judge to the higher court.

Chief Justice A. J. Weber in a written opinion observed that "it will not do for a dealer to say a 1921 model is substantially the same as a 1922 model. The evidence is that 'the trading value' of a 1922 model is greater than that of a 1921 model. It is true that a later model may be no better than one a year or years older." Then followed a lengthy dissertation comparing the model idea to style in women's gowns.

FABRIC BODY OFFICERS

DETROIT, Dec. 24.—Officers of the recently organized Fabric Body Corp., licensed to build fabric bodies using Meritas leather cloth, are announced as follows: President, Kenneth L. Childs, former research and development engineer of the Standard Textile Products Co., of New York; treasurer, J. H. Main, director of purchases of General Motors Corp.; secretary, Wright W. Gedge, experimental engineer of the Stearns & Foster Co. Including the above, the following are directors: Arthur D. Allen, president of the Mengel Co., of Louisville; James B. Wilson, vice-president of the Mengel Co.; James T. Broadbent, vice-president and general manager of the Standard Textile Products Co., of New York; L. D. Stickney, sales manager of Landers Brothers Co., Toledo.

CONCERNING MEN YOU KNOW

E. H. Baughman, manager of the Atlanta office of the Ozburn-Abston Co., one of the largest accessory jobbers in the South, and for the past two years president of the Southern Automotive Equipment Jobbers Association, has resigned his position, effective Jan. 1, 1924. Baughman has not as yet announced his future plans.

J. E. Johnson, wholesale manager for the White Co. in the southern states with headquarters in Atlanta, has been appointed general manager of the company's branch at Charlotte, N. C., and will have full charge of that territory which comprises the two Carolinas.

Fred C. Burnett, formerly sales manager for C. N. & F. W. Jonas Co., automotive parts sales organization, Chicago, has been appointed sales manager of the jobbing division of the Federal Pressed Steel Co., of Milwaukee. Burnett's headquarters will be 1202 London Guarantee & Accident Bldg., Chicago.

C. B. Crutchfield, sales manager, Stoughton (Wis.) Division, Moline Plow Co., manufacturing heavy duty wagons, trailers, etc., has resigned to accept the position of sales manager, Louisville (Ky.) Division, Chevrolet Motor Co.

J. I. Farley, president of The Auburn Automobile Co., recently announced an important change in the Auburn executive personnel. Roy Faulkner, formerly sales manager, has been advanced to the position of director of sales—the chair left vacant by Farley on his election to the presidency last August. E. H. Gilcrest, formerly vice-president and director of sales of the Westcott Motor Car Co., has been appointed to the position of sales manager, left vacant by Faulkner's elevation. Roy A. Sears, formerly advertising manager of The R & V Knight Motor Co., of East Moline, Ill., has been appointed advertising manager of Auburn.

C. A. Vane, general manager of the National Automobile Dealers Association, and Mrs. Grace E. Roberts were married recently in St. Louis. Both are members of the St. Louis Bar Association and their acquaintance began while both were students at a law school.

J. Murray Page, who had been connected with the automobile trade in Chicago for 20 years, most recently as general manager of the Locomobile branch, died Dec. 20 in San Francisco, following a long illness. He went to the Pacific Coast seven months ago for his health. His body was sent to Chicago for burial.

B. W. Arnold, since June 1, 1917, general manager of the railway properties of the Eastern Wisconsin Electric Co., at Oshkosh, Fond du Lac and Sheboygan, Wis., has been appointed general manager of the motor coach division of the Chicago, North Shore & Milwaukee Line, with headquarters in Milwaukee. Both the North Shore and Eastern Wisconsin properties are affiliated with the Insull interests of Chicago. The North Shore has developed a system of motor transportation in connection with its electric interurban line between Chicago and Milwaukee, and now operates more than fifty motor busses in southern Wisconsin and northern Illinois.

Rehabilitation of the Latex tire factory at Fond du Lac, Wis., which suspended operations a short time ago because of the lack of adequate working capital, has been effected. The Latex Tire Co. of Fond du Lac has been incorporated in Wisconsin with a capital of \$100,000, as the

operating concern. The Latex Tire & Rubber Co. will be continued as the holding company. It has given the new concern a 10-year lease of its plant and equipment at a satisfactory figure. Operations will be resumed on or before Feb. 1, on a schedule calling for 300 casings a day, with a gradual increase to the capacity of 600 daily.

When John N. Willys recently celebrated his fiftieth birthday anniversary the boys at the plant in Toledo presented him a silver loving cup and testimonial containing the names of the leaders in his factory organization.

R. W. Buckle, 44 years old, an automobile dealer of Stafford, Kan., and his only daughter, Aldine, 18 years old, were killed at Hutchinson, Kan., December 14, when their automobile was struck at a railroad crossing by a Missouri-Pacific train. Mrs. Buckle, who had a seat by the side of her husband, suffered only an abrasion of the right knee. Buckle, who was a member of the Spanish War Veterans of Hutchinson, was on his way to that city to attend a meeting of the organization.

Harry G. Farr, representative of an automobile distributing syndicate in Melbourne, Australia, is in the United States to attend the New York and Chicago shows and visit manufacturers with a view to making a distribution connection. He will be at the Biltmore Hotel in New York during the National show.

R. S. (Bob) Murphy, for many years connected with the automobile industry at Springfield, Mo., has formed the Murphy Tire Co. in Springfield and will distribute the General tires in Southern Missouri. Murphy for many years was connected with the Firestone company and later joined the national sales force of the General Rubber Co., of Akron, Ohio. The new firm will maintain both wholesale and retail departments in Springfield.

Charles G. Hanna, Lincoln and Ford dealer in Syracuse, N. Y., has been elected president of the Common Council on the Republican ticket.

R. M. Blundin, salesman for R. S. Sayer, Jr., Philadelphia distributor of Oakes accessories, has been announced the winner of the Oakes Co. Christmas contest. A cash prize was awarded him as the individual making "the best general sales effort" during the period of the contest, Nov. 26 to Dec. 15.

Frank D. Phillips, who for two years was a division manager of the Studebaker Corporation at South Bend, Ind., has been appointed manager of the wholesale branch of the factory for the St. Louis territory and is now in St. Louis at the company's office, 1914 Railway Exchange Building. The territory comprises eastern Missouri, southern Illinois, western Kentucky and northern Arkansas.

D. C. McCready has been made district manager of the northwestern division of the Goodrich company, Minneapolis, covering Minnesota, the Dakotas, parts of Montana, Iowa, and Wisconsin. He succeeds H. M. Baker, made coast manager for a Goodrich subsidiary. He has been manager at Pittsburgh, traveled out of Akron, was in charge of sales in Washington, and district manager at Cincinnati.

G. L. Neefus, Hartford, Conn., factory representative of the Rolls-Royce, has resigned and joined the sales department of S. A. Miner, Inc., Pierce Arrow distributor at 269 Connecticut boulevard.

eightth street.

Some of the tire companies which have moved to the Central Manufacturing District are Dunlop, Fisk, Gates, Goodrich, Goodyear, Howe, Kelly-Springfield, Lee, Mason, McGraw, Norwalk, Republic and Victor.

NASH GAVE CHRISTMAS BONUSES

MILWAUKEE, Wis., Jan. 1.—The Nash Motors Co., with main works in Kenosha, Wis., and a four-cylinder division in Milwaukee, distributed in excess of \$340,000 in holiday gifts and bonuses to its entire staff of employees. In addition to a percentage bonus of the annual salaries and wages, each worker was presented with a crisp new \$10 bill. The number of employees is about 5,500.

"Dr." Robert E. Lee Gives 1924 Success Prescription

Tongue Twisters, But Problem Solvers Are the Ingredients Recommended

ST. LOUIS, Dec. 29.—In a letter to the members of the St. Louis Automobile Dealers' Association, Robert E. Lee, manager, gives us the proper prescription for success in 1924, a tonic composed of four ingredients: Aptly Applied Ambition, Correctly Controlled Caution, Eagerly Enthusiastic Earnestness and Persuasively Prudent Persistency.

His letter follows:

"It is possibly good that Christmas comes but once a year—but, that one Christmas annually is worth something to us.

"Just such a day as Christmas is needed in our industry to give us pause to realize that we are just ending a year that has not been half bad, a year that has left no real heart scars behind it, a year in which we have cashed in fairly well on the total amount of energy, effort, foresight and enthusiasm which we have put into the selling of our automotive merchandise.

"I cannot believe that we should blame Providence for our mistakes of judgment or our failures to be at home when Opportunity knocks. Providence, having a pretty big job on hand, has been busy elsewhere. Our little problems were our own to solve. Providence only lays down general rules, not specific business or social instructions.

"May I offer you a sovereign prescription for certain business success in the New Year as follows:

Aptly Applied Ambition.
Correctly Controlled Caution.
Eagerly Enthusiastic Earnestness.
Persuasively Prudent Persistency.

"If that in liberal doses does not bring you a Prosperous New Year, better shut up the shop."

DEALERS MAY SELL SULPHATE

DETROIT, Dec. 29.—Reports that Ford Motor Co. will require dealers to sell ammonium sulphate, a by-product of its coke plant used for fertilizer, is dismissed by factory sales officials with the statement that the company has not enough of this product to meet the farmer demand within a 300 mile radius of the factory.

Output of the River Rouge plant is approximately 24 tons daily. This is so much in demand that it is sold out always about six months in advance of production. The State of Michigan alone takes 75 to 80 per cent of it, the remainder being apportioned to branches within the factory radius. Where a supply is requested from outside territory, the company makes provision for it, but is seldom able to make a shipment within three to six months.

Because of the existing heavy demand and the limited output there is no possibility of anyone being required to take any for general sale.

Tire Branches Desert High Priced Locations in Chicago

CHICAGO, Dec. 29.—There has been a migration of tire manufacturers' branches from Chicago's high rent automobile row on Michigan avenue to the Central Manufacturing District in the southwest section of the city. In the new location the tire companies not only obtain lower rents for offices but also are able to get adequate warehouse space at reasonable charges.

The departure of the tire company branches from Michigan avenue has left a large number of desirable store rooms vacant, and just now the for rent signs are liberally sprinkled along the automobile row from Twelfth street to Twenty-

IN THE RETAIL FIELD

The Nash-McLarty Motor Co., of Dallas, distributor for Nash cars in the greater part of Texas, has established a wholesale distributing house in Abilene, Texas. The name of the new house at Abilene is the West Texas Nash Motor Co. E. J. Negy is in charge of the Abilene branch.

O. W. Farmer, proprietor, Overland Garage, Lake Mills, Wis., has started work on a 1-story addition, 50x76 ft., to be used largely for the service department.

The Reddick Co., Memphis, Tenn., has taken over the Peerless distribution which formerly was handled by the Lilly Carriage Co., now devoting its attention to Chevrolet and Pierce-Arrow sales.

Pink's Motors, Ltd., Brisbane, Queensland, Australia, has been named as the second Auburn distributor in Australia. The appointment was made after Frank Pink, head of the company, visited the Auburn factory recently. He has just sailed for home.

At a pre-Christmas meeting of the Kelley-Reppert Motor Co., of Kansas City, Mo., a bonus of \$8,000 was distributed among the employees of the company.

George Zulliger, Tuscobia, Wis., has disposed of local interests and is locating in Rice Lake, Wis., as Chalmers and Maxwell dealer.

The Capital City Rent-A-Car Co., Madison, Wis., has been organized by E. C. Pearson and Paul Schlimgen to continue the business established at 434 West Gilman Street several years ago by J. B. and W. J. Flaherty.

Tools for mechanics and specialties for the garage and service station will be manufactured by the Auto Service Tool Co., which has been incorporated at South Milwaukee, Wis., by Lem E. Hendee, R. E. Osterlah and C. J. Lemont.

Frank Knuth & Co., Sturgeon Bay, Wis., has been incorporated with \$50,000 capital to take over the entire business of the Sawyer Implement Co., Sturgeon Bay, featuring the International Harvester line of trucks, tractors, engines and farm machinery. Frank Knuth, head of the new company, is the principal owner of the Sawyer company.

The Minneapolis Tire Dealers Association has elected as officers: President, B. E. Bullis; vice-president, Harry Russell; secretary and treasurer, Harold Lundberg; directors, Ray Fay, A. J. Hutchinson, R. H. Maxfield. Report of the national meeting was made by E. F. Farley.

A direct factory branch of the Olds Motor Works has been established in Dallas, Tex. Walter Zimmerman is manager. The Dallas house will carry everything necessary to the complete service of the Olds owners in Texas.

The Palace Motor Sales Corporation at 103 Albany avenue, Hartford, Conn., has taken over the sales and service building formerly occupied by the Bowman Motor Car Co. at 331 Connecticut boulevard.

The Bowman Motor Car Co., 331 Connecticut boulevard, Hartford, Conn., has discontinued the Willys and Overland. As to whether the firm will continue at some other location with a different line has not yet been fully decided. New representation is coming into the territory on the Willys-Knight and Overland and will be in evidence about Jan. 1.

M. E. Hills Company, 6523 Euclid avenue, Cleveland, has been appointed distributor of Oakes automobile accessories by The Oakes Co., Indianapolis.

Floyd Rittger has organized the Rittger Motor Co., 210 West Adams street, Clinton, Ill., to handle the Oakland car.

The Ponca City Automobile Dealers Association has been formed at Ponca City, Okla., with the election of the following officers: President, C. G. Weathers; vice-president, Orville Savage; secretary and treasurer, W. W. Vance.

The Carter Motor Co. has been incorporated at Dexter, Mo., with a capital of \$20,000.

S. G. Anthony has taken over the O. J. Watson Motor Co. at Ponca City, Okla., and will have the building remodeled before showing the 1924 models of the Overland and Willys-Knight car.

The tire, battery and garage men of Ponca City, Okla., have announced that they will go on the cash basis after Jan. 1.

The Joplin Motor Car Dealers Association at Joplin, Mo., has been reorganized with the election of Earl R. Lanpher as president and Paul D. Hammacher as secretary. The organization will start an intensive campaign for new members and will then sponsor a big automobile show for Joplin sometime during the spring.

The Yale Auto Co., Chevrolet dealer, has moved from 524 Louisiana street to 309-311 Center street, Little Rock, Ark.

The following are among new automobile

agencies recently formed in the Southeast: Barnes Motor Co., Noxupater, Miss., \$10,000 capital; McCreary Motor Co., Brevard, N. C., \$40,000 capital; Prather-Smith Co., Mount Airy N. C., \$10,000 capital; Raleigh Grey Motor Co., Raleigh, N. C., \$25,000 capital.

H. E. Francis, formerly with the Bliss Auto Sales Co., Toledo, O., handling the Hudson-Essex line, has opened a neighborhood sales and service station at 3424 Monroe street, that city, as an associate dealer.

The Standard Motor Truck Co., of Detroit, announces the appointment of Charles H. Currens, of Atlanta, as distributor of the Standard in the Atlanta and adjacent territory. Currens' present headquarters for the district are at 904 Candler Bldg., Atlanta.

The Republic Truck Sales Co., Inc., of Knoxville, Tenn., has increased its capital from \$5,000 to \$20,000, and changed the name as above from the Republic Truck Co. They distribute the Republic truck in the eastern Tennessee territory.

The McFarlan Jordan Co., 174 High street, Hartford, Conn., has taken on the Rollin to round out its line of McFarlan and Jordan.

Among new Nash dealers are the following: Morris & Dean, Napa, Calif.; Musgrave Motor Co., Pittsburg, Kansas; Lewis Scofield, Zumbrota, Minn.; Wm. C. Shackett, Saranac Lake, N. Y.; Cross Roads Garage, Inc., Roslyn, L. I., N. Y.; Wm. C. Wood, Spring Valley, N. Y.; Theo. C. Travis, Gilboa, N. Y.; Wesley Bros., Mount Kisco, N. Y.; Brazington Auto Paint Works, Darlington, S. C.; Wessington Springs Nash Co., Wessington Springs, S. Dak.; C. J. Smith, Sherman, Texas; Shiner Motor Sales, Shiner, Texas; Frest Motors, North Bay, Ont., and Fred Davison, Sudbury, Ont.

Lee Abrams will open salesrooms for the Rollin in 1337 Main street Buffalo, N. Y., about Jan. 1. It will be known as the Rollin Buffalo Co.

Ray A. Robinson has organized the Ray Robinson Motors, at 1112 Main street, Little Rock, Ark., and has taken over the Maxwell and Chalmers contracts. For the past year and a half he was a partner with Robinson-Smith Automobile Co., at 918 West 14th street. Paul S. Freeman is sales manager of the new firm.

The Jordan Motor Sales Co., Youngstown, O., has been chartered with an authorized capital of \$10,000.

Thomas H. Smart Motor Co., one of the largest motor dealers in Memphis, Tenn., has taken on the Jordan car for the Memphis territory. Thomas H. Smart, head of the company, is one of the gold star members of the Old Timers' Club, having been an executive in the motor car industry for 20 years. He has made a great success with the Hupmobile.

The Curtis Motor Co., Baltimore, has changed its name to the Baltimore Flint Co.

The Nelson Mitchell Co., 525 Jefferson street, Milwaukee, formerly Wisconsin distributor of the Mitchell, but for the past year state distributor of the Stutz, has changed its name to the Nelson-Moehle Co. James A. Moehle, of Milwaukee, has acquired an interest and has become actively associated with the management. John E. Nelson is president and general manager. The Nelson-Moehle Co. has been appointed distributor of the Rollin, continuing also as Stutz representative, and official service station for the Mitchell in Milwaukee county.

The Menominee Hudson Co. has been organized at Menominee, Mich., by Walter A. Niemann, to distribute the Hudson and Essex in Marinette, Wis., and Menominee, twin cities, and contiguous territory. A sales and service headquarters has been established in the Masonic Temple building on Ogden avenue in Menominee, and a branch will be maintained in Marinette. Niemann formerly was sales manager of the Northland Motors Co., and later associated with the Menominee Ford Co.

The S. B. Jack Auto Sales Co., Milwaukee, community dealer in the Overland and Willys-Knight, has moved from 597 Mitchell street to new and more commodious quarters at 263-267 Twenty-second avenue. The service department is doubled in size. Richard Weber, for 12 years with the Overland Wisconsin Co., distributor, has joined the Jack organization as service manager.

The Nelson Mitchell Co., 525 Jefferson street, Milwaukee, distributor of the Stutz, and originally Mitchell dealer, has been appointed also wholesale representative of the new Rollin in Wisconsin and Milwaukee dealer.

The Sayers Motor Co. is a late addition to the Houston, Tex., automotive row. The company was incorporated last week. It will handle the Marmon and Gardner cars in the Houston district. Arthur Sayers is president and general manager.

St. Louis Dealers Made It "An Automotive Christmas"

Car and Accessory Dealers Report Many Sales; Displays Aid Greatly

ST. LOUIS, Dec. 29.—Automobile dealers and accessory firms are convinced that the great effort put forth in St. Louis to "Make This an Automotive Christmas" were well repaid. Automobile dealers report many sales were made and supply firms generally reported a good demand for automotive equipment to be given as Christmas presents.

A big share of the credit for the successful campaign is attributed to the novel displays in the showrooms of automotive concerns. These displays took various shapes and forms, but one of the most unusual was that of the Vesper Buick Co. which departed from the beaten path of Christmas displays and exhibited in a corner window live chickens, ducks, turkeys and pigs with the injunction "Drive Back to the Farm For Christmas in a Buick." The birds and animals were brought in from F. W. A. Vesper's farm.

Many windows followed the more or less conventional style of Christmas trimming with the red and green color scheme predominating. Some showed the life size figures of donors and recipients of cars on Christmas mornings. Others adopted a snow scene and more than all the Christmas tree with a figure of Santa Claus was used.

The sign suggested by the St. Louis Automobile Dealers' Association and written by the association manager, Robert E. Lee, "Will She Get a Car For Christmas?" was also praised as a business getter.

IOWA PAVES 100 MILES IN 1923

DES MOINES, Ia., Dec. 29.—With approximately 800 miles of grading, 400 miles of graveling and 100 miles of paving under contract or in the building, Iowa bids fair to lift herself "out of the mud" in 1924.

Six Toledo dealers for the Willys-Overland Co. have arranged a central emergency service for Sundays and nights for the owners of Overland cars in the city. Towing and gasoline delivery is included in the emergency program.

Norman E. Stoneburg, 2021 Adams street, Toledo, O., has been appointed distributor for the Columbia Six for his city and adjacent territory.

Aaron G. Cohen, Inc., 187 Park street, Hartford, Conn., New England distributor for the Lexington, has taken over sales quarters in Boston at 884-888 Commonwealth avenue. The business will be directed from Hartford.

F. S. Bliven, of the Standard Motor Distributing Co., Baltimore, has been appointed distributor for the new Rollin car in Maryland, Virginia, District of Columbia and part of West Virginia.

Among new Auburn dealers are the following: J. R. Watson, Coldwater, Mich.; Superior Service & Repair Shop, 524 N. Lake street, Ironwood, Mich.; Koppes Garage, Mechanicsville, N. Y.; Glen Burnie Garage, Glen Burnie, Md.; Smith Motor Car Co., Warren, O.; Belmore Motor Co., Webster, Mass., and A. E. Taylor, Ludlow, Vt.

Morris Adler Co., Dodge dealer at Quincy, Ill., started last week on its eighth year in business selling Dodge Bros. motor vehicles. Morris Adler is president and general manager of the company.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Akron, Ohio.....	February	Automobile Dealers Co., Frank O. Neil, Manager.
Albany, N. Y.....	Feb. 16-23	Albany Automobile Dealers' Association, J. B. Wood and L. Y. Long, Managers.
Albuquerque, N. M.....	Feb. 7-9	Albuquerque Automobile Trade Association, E. G. Fuhrmeyer, Secretary.
Atlanta, Ga.....	Feb. 16-24	Atlanta Automobile Association, Virgil W. Shepard, Manager.
Baltimore.....	Jan. 19-26	Baltimore Automobile Dealers' Association, John E. Raine, Secretary.
Beaver, Pa.....	Jan. 23-26	Beaver County Automobile Dealers Association, James W. Doncaster, Secretary.
Boston, Mass.....	March 8-15	Boston Automobile Dealers' Association and the Commercial Motor Vehicle Association, Chester I. Campbell, Manager, 5 Park Square.
Brooklyn.....	Jan. 19-26	Brooklyn Motor Vehicle Dealers' Association.
Buffalo.....	Jan. 12-19	Buffalo Automobile Show Committee, Carlton C. Proctor, Manager.
Calumet, Mich.....	April	Central Storage Co., Jos. A. Savini, Manager.
Camden, N. J.....	March 3-8	Camden Automobile Trades Association, M. T. Ivins, Manager.
Charlotte, N. C.....	March 3-8	Charlotte Automotive Trades Association, George E. Wilson, Chairman.
Chicago.....	Jan. 26-Feb. 2	N. A. C. C. National Show, Coliseum and First Regiment Armory, S. A. Miles, Manager.
Chicago.....	Jan. 26-Feb. 2	Annual Salon, Drake Hotel.
Cincinnati.....	Feb. 9-16	Cincinnati Automobile Dealers' Association, Harry T. Gardner, Manager.
Cleveland.....	Jan. 19-26	Cleveland Automobile Dealers' and Manufacturers' Association, Herbert Buckman, Manager.
Columbus, Ohio.....	Feb. 4-9	Columbus Automobile Dealers Co., Anson B. Coates, Manager.
Dallas, Tex.....	Feb. 11-17	Dallas Automobile Trades Association.
Deadwood, S. D.....	Feb. 19-23	Deadwood Business Club, F. R. Baldwin, Manager.
Des Moines, Ia.....	Feb. 25-March 1	Des Moines Automobile Trades Association, C. G. Van Vleit, Manager.
Detroit, Mich.....	Jan. 19-26	Detroit Automobile Dealers' Association, H. H. Stuart, Manager.
Elmira, N. Y.....	Jan. 21-26	Elmira Automobile Merchants' Association, T. W. Keeton, Manager.
Goldsboro, N. C.....	April 21-26	Chamber of Commerce, W. C. Denmark, Manager.
Grand Rapids, Mich.....	Feb. 25-March 1	Passenger Car Dealers' Association, M. D. Elgin, Manager.
Great Falls, Mont.....	March	Montana Automobile Distributors' Association, Lyman E. Jones, Manager.
Green Bay, Wis.....	Aug. 25-30	Automotive Division, Association of Commerce, W. F. Kerwin, Manager.
Greenville, S. C.....	Feb. 25-March 1	Greenville Chamber of Commerce.
Hackensack, N. J.....	Jan. 12-19	Automotive Trade Association of Bergen County, Moe Katzman, Manager.
Hartford, Conn.....	Feb. 16-23	Hartford Automobile Dealers' Association, Arthur Fifoot, Manager.
Huntington, W. Va.....	Feb. 24-29	Huntington Automobile Dealers' Association, G. B. Roberson, Manager.
Indianapolis.....	March 3-8	Indianapolis Automobile Trade Association, John B. Orman, Manager.
Kansas City, Mo.....	Feb. 9-16	Kansas City Motor Car Dealers' Association, George A. Bond, Secretary.
Louisville, Ky.....	Feb. 18-23	Louisville Automobile Dealers' Association, George T. Holmes, Secretary.

Mankato, Minn.....	Feb. 27-Mar. 1	Mankato Automobile Dealers' Association, E. J. Dillman, Secretary.
Milwaukee.....	Jan. 19-26	Milwaukee Automotive Dealers' Association, Bart J. Ruddle, Manager.
Milwaukee, Wis.....	Aug. 25-30	Milwaukee Automotive Dealers' Association, Fall Show, Bart L. Ruddle, Manager.
Minneapolis, Minn.....	Feb. 2-9	Minneapolis Automobile Trade Association, Walter R. Wilmot, Manager.
Montreal, Canada.....	Jan. 19-26	Montreal Automobile Trade Association.
Muskegon, Mich.....	March 4-8	Muskegon Automobile Trade Association, J. C. Fowler, Manager.
Newark, N. J.....	Jan. 12-19	New Jersey Automobile Exhibition Co., Claud E. Holgate, Manager.
New York.....	Jan. 5-12	N. A. C. C. National Show, Eighth Coast Artillery Armory, S. A. Miles, Manager.
Oakland, Cal.....	Jan. 12-19	Alameda County Automotive Trades Association, Robert Martland, Manager.
Oklahoma City, Okla.....	March 24-29	Oklahoma City Motor Car Dealers' Association, E. T. Bell, Secretary.
Omaha, Neb.....	Feb. 18-23	Omaha Automobile Trade Association, A. B. Waugh, Manager.
Orlando, Fla.....	Feb. 12-16	Subtropical Midwinter Fair Association, C. E. Howard, Manager.
Philadelphia.....	Jan. 12-19	Philadelphia Automobile Trade Association, W. H. Metcalf, Manager.
Pikeville, Ky.....	Jan. 17-19	Eastern Kentucky Automobile Show, F. W. Ruddy, Secretary.
Portland, Me.....	Feb. 25-March 1	Portland Automobile Dealers' Association, Howard B. Chandler, Manager.
Portland, Ore.....	Feb. 9-15	Automobile Dealers' Association of Portland, Ralph J. Steahli, Manager.
Rochester, N. Y.....	Jan. 21-26	Rochester Automobile Dealers' Association, S. Park Harman, Manager.
Sacramento, Cal.....	Sept. 1-10	State Agricultural Society, C. E. Paine, Manager.
Saginaw, Mich.....	March 4-8	Saginaw Automobile Dealers' Association, Guy S. Gauber, Manager.
San Francisco.....	Feb. 16-23	San Francisco Automobile Dealers' Association, G. A. Wahlgreen, Manager.
Scranton, Pa.....	Feb. 4-9	Scranton Motor Trades Association, Hugh B. Andrews, Manager.
Sioux Falls, S. D.....	Feb. 6-10	Sioux Falls Automobile Association, John P. Blug, Manager.
Springfield, Ill.....	March 20-22	Springfield Automobile Dealers' Association.
Springfield, Mass.....	March 3-8	Springfield Automotive Dealers' Association, Harry W. Stacy, Manager.
St. Louis.....	Feb. 17-24	St. Louis Automobile Dealers' Association, Robert E. Lee, Secretary.
Syracuse, N. Y.....	Feb. 25-March 1	Syracuse Automobile Dealers' Association, C. H. Hayes, Manager.
Toledo, Ohio.....	Feb. 4-9	Automotive Trades Association, H. V. Buelow, manager.
Toronto, Ont.....	Aug. 23-Sept. 6	Canadian Automotive Equipment Association and the Automotive Industries of Canada, Gib Robertson, Secretary.
Troy, N. Y.....	Feb. 2-9	Troy Automobile Dealers' Association, Frank M. Baucus, Manager.
Washington, D. C.....	March 8-15	Washington Automotive Trade Association, Walter Lambert, Secretary.
Washington Hgts., N. Y.....	March 26-31	Washington Heights Automobile Dealers' Association, H. G. Stiles, Manager.
Waterbury, Conn.....	Jan. 14-19	Waterbury Automotive Dealers' Association.

CONVENTIONS

Albuquerque, N. M.....	May 26-31	U. S. Good Roads Exhibition.
Chicago.....	Jan. 14-19	Good Roads Show.
Detroit, Mich.....	Jan. 23	Annual Convention of the Michigan Automotive Trade Association.
Detroit, Mich.....	Jan. 22-25	S. A. E. Annual Meeting.
Montgomery, Ala.....	Jan. 21	Annual Meeting of the Alabama Automotive Trades Association.
New York City.....	Jan. 5	Annual Meeting of the Automotive Electric Association.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

May Need Rings After 9000 Miles

Q—Give us information in regard to a Continental 7 R engine. This motor has done just 9,000 miles and it had very good care. The engine has a knock which sounds like ignition and also the engine has no pep when you step on it a little quicker going up a little grade. We have checked up on the timing, valve and ignition, and found it to be O. K. We also have ground the valves and scraped the carbon out but with the same results.

Then we got a dry squeak in the motor in 4th or 5th cylinder, we thought it was the generator so we took it off altogether and still we had it. We traced it back to the 4th and 5th cylinder and we thought we had a broken ring then we took all the pistons out and found the rings to be O. K. and in fine shape in each cylinder. We put the pistons back and the same squeak was there. This only happens when the engine is running slow. I also have had this car to a Stromberg service station and they said the carburetor was O. K. though I had thought it was the cause of the car being lazy.—Jack P. Heidenfelder, Brooklyn, N. Y.

Our first suggestion is that you go over the oiling system on this engine very carefully. The dry squeak would indicate a ring that was not thoroughly lubricated and, if this condition has existed for any length of time, it will necessitate a new set of rings. Although it is impossible to strike an average you can figure that an engine that has gone 9,000 miles may require new piston rings. This is true especially when the oiling system has been deranged in some way so that the proper amount of oil does not reach the pistons.

You state that you ground the valves but do not mention whether or not the compression is good. If there is any variation in compression, or if all cylinders seem to be weak as compared to a Continental engine of the same model that is known to be in good shape, we would suggest the installation of new rings. This probably will take care of the dry squeak and also the lack of pep.

If the ring is allowed to go dry for any length of time it is possible for it to stick in the grooves and break loose at different times causing a knock at idling speeds.

Another common source of trouble, encountered also at idling speeds, would be timing gears that are worn.

Regarding the spark timing would suggest that you set it far enough ahead that the car will show a spark knock when accelerating. When you have done this retard it until the knock just disappears at half advance and this will be the correct ignition timing.

The third suggestion is that you search for a valve stem guide that is running

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

dry. Valve stems that do not have the proper lubrication in the guide will stick now and then and especially at high speed and this may account for the lack of power and pep and also may produce a noise. In addition to the above suggestions therefore, we would advise that you go over each valve individually and make sure that the stems are lubricated and work freely in the valve stem guides.

HAS MOTOR FOR TEST BENCH BUT NO CITY CURRENT

Q—We would like to have a little information on how to build a test bench for generators and starters. We have a ¼ hp. electric motor. We have no city current. We would like to have an attachment that would hold the generator so it could be operated with this motor and drive the generator at various speeds. Motor runs 1735 r.p.m.

1—If you have no city current we wonder how you are going to operate the motor. Perhaps you have a lighting plant which generates current and if so you should make sure that the motor is designed for the same voltage as your lighting plant. We will give you, by separate letter, the names of a number of concerns making test bench equipment,

and from one of them you can secure a generator fixture such as you describe.

2—What could be wrong with a Bosch high tension D.U. 4 magneto when it will work all right when laid on a steel plate on the test bench but will not work when put on the magneto base on the car?—John A. Dollison, Quaker City, Ohio.

Magneto O. K. on Bench But Dead on the Car

2—If the magneto works when put on a steel plate on the work bench it shows that there is nothing wrong with the magneto and putting it on an iron bracket on the car has nothing to do with the case. It is possible that in testing on the bench you do so with the distributor cap removed and test to see that a spark jumps in the safety gap. It is also possible that you have the pencil removed which connects through from the high tension secondary terminal to the center of the distributor cap. It is possible that either the high tension pencil is punctured or that there is a leak in the distributor cap.

It is also possible that the high tension wiring is shorted on the car, or run through a metal tube of some sort and that the wiring is old and allows the sparks to jump through to the metal conduit. It is also possible that on the car you have the interrupter cover in place and the wire going up to the switch may be grounded so that it kills the magneto.

We would suggest your making the test on the engine exactly as you do on the bench and by eliminating one thing at a time you will doubtless discover the trouble.

It is also possible that you are testing it on the bench and only getting a short spark which jumps $\frac{3}{4}$ or $\frac{1}{2}$ in., which is not enough to work on the engine where it has to jump a $\frac{3}{4}$ gap under compression.

EFFECT OF LIGHT PISTONS IN TRUCK

Q—We have a Mack truck model A. B. 2½ ton, and would like to know how much it would improve the operation to put in light weight pistons.—E. M. Carley, Drumright, Okla.

The advantage of light weight pistons is in the elimination to a great extent of vibration and in some reduction in the side wall friction and friction on the bearings. However, the advantage of light weight reciprocating parts is found chiefly when the engine speed is high as in some pleasure cars and in race cars. There will be some advantage of course in a truck engine but it will not be as pronounced as it would be in a very high speed engine.

A Family Entrance Advised Here

Q—Enclosed find plans for garage that I expect to erect in the near future. This building will face on a paved, state highway on the north, 12 ft. alley on the east, side street on the west, and on the south, or back end, the building will face on balance of lot. This lot measures 55 ft. wide by 140 ft. long. My intentions are to cover about 100 ft. of length of lot and build on later as necessary. The building will be 55 ft. wide.

Probably two or three cars on sales floor and one side of floor taken up in accessory department with a complete line. Two gasoline pumps in front of building. I can't say as to number of cars in storage but about 10 or 12 anyway. Four men in the repair department with complete equipment for general repair.

This building will be of brick, probably of wire cut face, with plate glass on front and on one side of showroom. Any information or improvement on the plans of the outside of this building will be appreciated as I want a good looking building, also any change on the interior arrangement of the showroom or shop. I want everything as convenient as possible.

I had planned on steel trusses to support the roof set on 18 ft. centers but I have decided to use a wooden truss instead, placed on 16 ft. centers. This will change the length of the building some, but I think I can save some money by using the wooden truss as I have plenty of material to build them. I would like any information you can give me on the construction of a truss for a 55 ft. span with 60 pounds to the square foot of roof load.

I had in mind an arched truss built up of 2x4 and 2x6 and 2x8. I think it is called the Newton truss. There are a number of buildings using this truss in this locality, some with a span of 100 ft. and 12 ft. high arch. I had planned on about 8 ft. high arch. I would like to know if this truss is patented and if so who controls it.

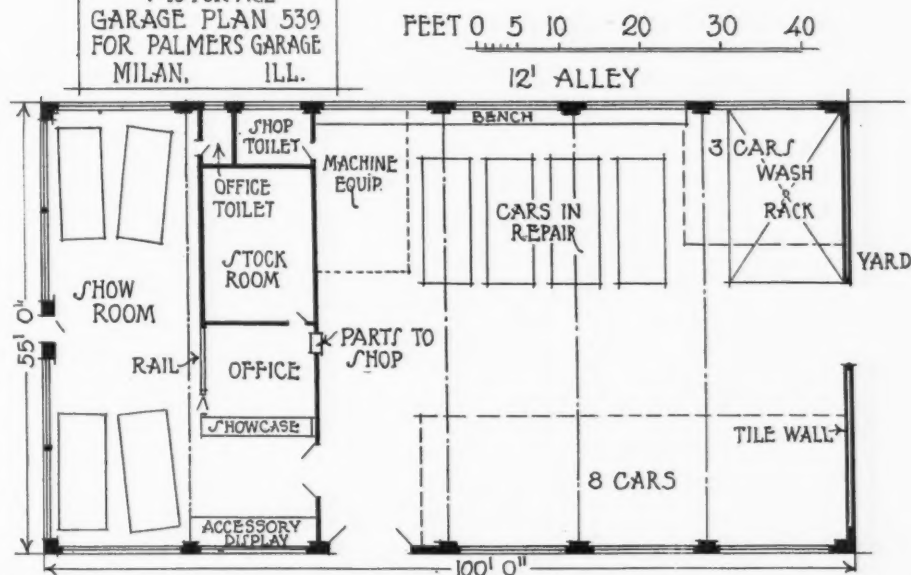
I may do away with trusses over the showroom and stockroom and use posts in place.

Give me approximate positions to place them so as not to interfere with cars in showroom.—Palmer's Garage, Milan, Ill.

Considering that you have a side street on one side of your building and an alley on the other, we can see no reason for using valuable frontage for a garage entrance. If there is any need at all for a second entrance other than the one opening on the side street, we would suggest that you make it at the rear where it will not take up any space that is valuable for other purposes. By including the space taken up by the front entrance you have narrowed up the showroom considerably, making it longer and narrower and getting the stockroom, office and accessory store into a space somewhat smaller than in your plan.

In a building of this size it would not be advisable to separate the shop from the rest of the garage and consequently, we have suggested the use of one side of the garage for shop purposes and the other side for car storage. The windows

MOTOR AGE
GARAGE PLAN 539
FOR PALMER'S GARAGE
MILAN, ILL.



along the alley side will give ideal light and with the machines and special equipment installed in the front end, there will be no necessity of moving or rearranging if you enlarge your building by extending it to the rear. We would suggest that you make the rear wall of hollow tile in order that it may be taken down with the least possible amount of work.

In regard to trusses, we have never run across the Newton truss but presume that it is a patented design. There are three concerns in Chicago making trusses

of this type. These are the McKeown Bros. Co., 112 W. Adams St.; Summerbell Truss Co., 30 N. LaSalle St., and the Double Strength Truss Co., 833 N. California Ave. Any one of these concerns manufactures trusses which would be perfectly satisfactory for your use and we are under the impression that these people will all supply you with working drawings for building their trusses or furnish men to do the work if you wish. Most of these trusses have a height of one-eighth of the length which is somewhat less than you have planned.

MAINTENANCE A DOLLAR DOWN AND THE REST WHEN YOU CATCH 'EM

Q—In selling maintenance on an installment basis, what form of lien or contract would you advise that would protect the repairman in this province?—S. Collier, Hamilton, Ont.

A—Ontario does not give a lien by statute on automobiles repaired and maintained on an installment basis. As a matter of fact, such a basis is contrary to the common law lien, which is recognized in your jurisdiction. Possession is a necessary part of this lien. Where you extend credit, as in payment by installments, you negative the idea and intent of retaining possession.

Your 1923 legislature created by statute a lien for repairs on personal property. But this appears to be but a statement of the common law with the additional power to sell the property repaired and retained in possession, after 90 days. Under the common law lien one could not sell the property retained. He had the right only to hold possession.

Now, under the Conditional Sales Act,

a seller is given power to retain ownership of goods sold until fully paid, provided he files a copy of the agreement with the county recorder. It might be that you would obtain the results desired by following a plan of this kind.

Prepare orders to be signed by your customers covering both repairs, labor and other service, and include in your form a provision for a lien against the car repaired to cover these things. The whole order might be in the form of a promissory note. Then any such order should be filed for record with the clerk of your county or district court.

This suggestion is made on the theory that a lien may be created by contract. Whether it would stand the test of a court, I think, would depend on the question whether its recording gave constructive notice to the world that you held a claim against the repaired car covered by the contract recorded. If it did give notice, then it should protect you against subsequent purchasers. In any event purchasers would be put on their guard as they would not desire to buy a law suit and the suggestion should be beneficial from this angle at least.

Further you should add a clause agreeing to give you the authority and power to take possession and sell the repaired article covered by the order contract and to deduct from the sum received the expenses of the sale, your charges, then the balance to be returned to the car owner.

Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things,

we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

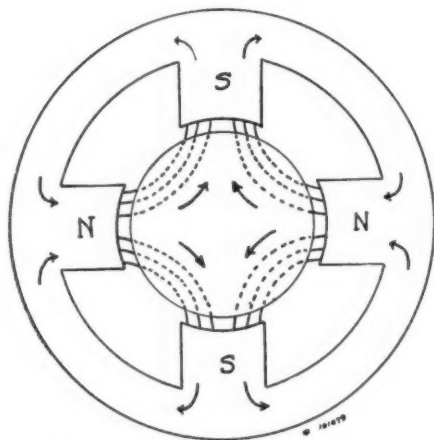
Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

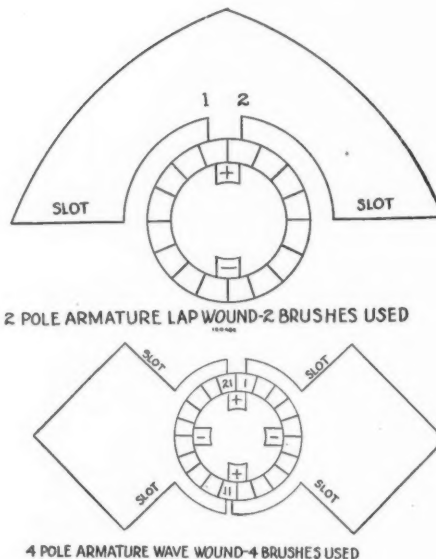
The Magnetic Lines Go in Again Out Again



Q—I would like to get information as to the working principle of the armature in a 4 pole generator? How does the flux or magnetism travel in a 4 pole generator?—John DeHondt, Sodus, N. Y.

We are showing three illustrations one giving a 4 pole magnetic field with arrows showing the direction of the magnetic lines of force while the other two illustrations show a four pole armature and a 2 pole armature respectively.

In the illustration of the magnetic field it will be seen that the poles are alternately north and south, and that the magnetism comes out the north pole and goes through the armature to the adjacent south poles. This would be true if we had 16 poles or 20 poles or any number of poles. Alternate ones would be north and south and each north pole would send out magnetism to the adjacent south pole. Arrows also show how the magnetism has a complete path through the frame of the machine.



As the armature will have the magnetism reversed in it four times it is necessary also to have winding reversed four times, and in the four pole illustration it will be seen that, starting from bar No. 1 and tracing to the right, the circuit goes out through a slot and then back through another slot to bar 11, then out through a third slot and back through a fourth slot to bar 21.

Then if the first slot should happen to be under a north pole the second one would be under a south pole, the third one under a north pole and the fourth one under a south pole, so that the direction of current back and forth through the armature changes as frequently as the direction of magnetism changes. This makes it possible for the voltages to be added or for the machine to be used as a motor. In similar manner in a two pole machine the two sides of a coil must be approximately 180 degs. apart.

SPLIT SKIRT PISTONS FOR A MARMON

Q—Just bought a 1917 Marmon model 6-34 which I intend to use myself. It is equipped with 34x4½ tires, so what gear ratio should I have in my differential?

The 1917 Marmon was regularly equipped with 34x4½ tires and used a 3.69 to 1 rear axle ratio.

2—I intend to fit it up with Kant-Skore pistons or aluminum pistons. Let me know the proper clearances for both.

2—The Kant-Skore piston is an aluminum alloy piston and the clearance as allowed on this split skirt type of piston will hold good on practically any of the other aluminum alloy split skirt pistons. The difference in diameter between the cylinder bore and the piston at the top ring land should be .032, at the second .022 and at the third about .020. The skirt clearance should be from three to four thousandths of an inch.

If the pistons are secured in a semi-finished condition we should suggest that you take great pains to see that they are properly relieved in the vicinity of the piston pin boss. The metal on the piston

on the outside, for a radius of one inch all around the piston pin boss holes, should be about ten to fifteen thousandths lower than the other part of the piston. Further information on this will also be supplied by the makers of the piston, if you so desire.

3—What is the value timing of this engine?

3—The exhaust valve should close 12 degs. after upper dead center and the inlet should open 19 degs. after upper dead center. The tappet clearance should be .003 to .004 inch. You will find valve timing marks on the flywheel, also will note that 12 degs. will equal approximately 1-32 to 1-16 of an inch in piston travel past upper dead center, in the direction of rotation.

4—I put two new cylinder head gaskets on this engine since I had it and every time I open the oil filling cap I can notice bubbles of water standing. About once a week I can drain about a quart of water off. How do you account for this as the gasket appears to be perfect?—M. B. Keith, New Canaan, Conn.

4—It is probable that the cylinder head is either cracked or one of the valve

guides in the cylinder head is leaking. Close up both the water ports on the head and remove it from the engine, then insert a common tire valve into one of these ports and pump up pressure. If you will insert the head in a tub of water sufficient to cover it when the head is under pressure it will show the presence of any leaks either in the valve guides or in the head itself. If the leak is in the valve guides new valve guides perhaps will cure the trouble and if the cylinder head, is leaking we would suggest that it be sent to a competent welder who will preheat it before doing the welding.

BETWEEN THE BEARINGS YOU WILL FEEL TWO FELT WASHERS

Q—Publish a cut of the Monroe rear end 1920. Explain how the felt washer can be installed in the drive shaft roller bearing housing to prevent the gear compound from leaking out. I have had this assembly out three different times and cannot seem to prevent the trouble. Can it be that there is a special felt, put out by the factory for this?—Altmeyer Garage & Taxi Co., Newark, Ohio.

1—An illustration of the Monroe axle is not available. We do not believe a picture will be necessary because you will find when you remove the assembly that there are two felt washers installed between the inner and outer ball bearings on the pinion shaft. It will be necessary, of course, to remove both of these bearings and to secure special felt washers from the Monroe Company. The axle used in this car is made by the Monroe Motor Car Company and requires a special felt which can be secured by addressing a letter to the Monroe Motor Car Company, Indianapolis, Ind.

GRABBING CLUTCH MAY BREAK AXLE SHAFT

Q—We have quite a bit of trouble with a Detroit six cylinder 1917 car. The owner has twisted off five axle shafts in the present axle. It is always the left axle and it twists off just outside of where it goes into the differential gear. From the looks of the shaft it appears to twist around part of a turn before the shaft gives away. Have adjusted the wheel bearings carefully and the brakes do not drag. The original axle assembly, as supplied for the car, was too light and the owner states that it was supplied with the present axle which was standard equipment on the last car built.—Penningtons Garage, Wauneta, Nebr.

The twisting of the shaft half way around before it breaks is an indication that the steel is quite tough but that it is subjected to an abnormal strain. We would suggest your taking a ride with the owner and see how he operates the clutch, that is after you get another shaft in place. It is also possible that the axle has some looseness in it so that it is difficult to apply the power without a jerk. If the clutch does not grab and the owner claims that the car starts smoothly and easily, then we would suggest having axle shafts made of nickel steel such as is used in shafts for race cars.

Operation of Clutch on 1923 Hupmobile

Q—We are having some trouble with the clutch on a late 1923 Hupmobile. When the engine is running you cannot change from neutral to low gear or from neutral to reverse gear without clashing the gears. I would like to know if there is any adjustment to prevent the clutch from dragging. I have been told that there isn't any adjustment.—Square Deal Garage, Santa Cruz, Calif.

An illustration of the model Series R to Series 10 Hupmobile clutch is shown. The clutch adjustment is made by placing the clutch spring retaining washer and key in different notches on the clutch spring stud. If such adjustment is ever found necessary all springs should be set the same, as otherwise the clutch operation would not be satisfactory.

In order to tighten the clutch the spring should be compressed and the key removed from the groove in which it is at that time, and placed one notch forward. This adjustment may be made after unbolting the flywheel pan. There should be $\frac{3}{8}$ in. clearance between the end of the clutch release shaft stop screw and the boss on the transmission case when the clutch pedal is at rest.

Clutch Brake

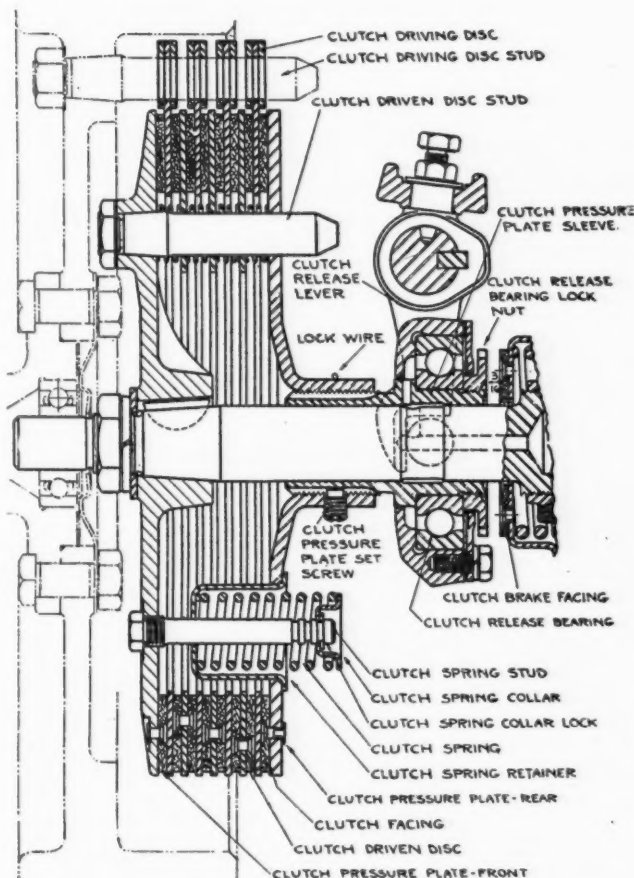
The clutch is provided with a clutch brake. The clutch release collar on which the clutch release ball bearing is mounted is screwed on the rear clutch pressure plate and locked by a set screw. This construction allows adjustment for distance between the clutch release collar and the clutch brake. When the car leaves the factory the distance between the clutch collar and the clutch brake is $\frac{1}{8}$ of an inch, but as the clutch facing wears, this distance increases, so that it will be necessary to make adjustment occasionally in order to retain a short clutch throw out as this distance should never be greater than $\frac{1}{4}$ in.

Adjustment may be made by removing the release collar and turning the clutch release collar to the left until the desired clearance of $\frac{1}{8}$ in. between the release collar and the clutch brake facing is obtained.

After obtaining correct clearance, drill $\frac{1}{4}$ -in. hole in clutch release collar to a depth of approximately $\frac{1}{8}$ in. (Note—This drilling is only necessary on a few cars as in most cases release collar is grooved.) Exercise extreme care and do not drill hole entirely through clutch release collar. When replacing release collar set screw be sure and lock with wire as originally found.

Clutch Pedal

The normal position of the clutch pedal in reference to the toe board may be varied by changing the position and length of the clutch pedal adjusting link between the pedal arm and the clutch release shaft lever. Excessive foot pressure should be avoided owing to the



great leverage provided at which soft clutch action is obtained. Too much pressure causes strain on all parts.

A change of pedal pressure changes the length of the travel of the clutch

pedal. The lighter the pedal pressure the longer the travel required. The clutch pedal may be adjusted to four different pressures and the method of securing these pressures is illustrated.

LE RHONE ENGINE FOR AIR SLED

Q—In the Winter Service issue, page 43, you have an article on building an air sled. I want to build an air sled and find that this article is not sufficient for the type of motor I have. The motor I have is an 80 hp. LeRhône rotary as used on some of the airplanes. Would appreciate very much if you would send me what information you can on constructing this air speed sled. I am starting work on the sled now and would like very much to get the information immediately.—H. M. Strong, Provo, Utah.

It would require considerable time for us to draw a complete design for a speed sled and the small drawing given in the Winter Service issue will be sufficient as a guide for the construction of a sled using any type engine.

Your greatest problem with the LeRhône will be the mounting and in this connection we believe that the quickest, best, and cheapest way would be for you to communicate with some of the firms who have used these engines in airplanes. The mounting utilized for this engine is very light and strong and perhaps can be purchased for considerably less than it would cost you to build one.

The Thomas-Morse Aircraft Co., Ithaca, N. Y., at one time manufactured a small airplane which used the LeRhône engine. If you will communicate with them asking for the complete set of parts and

the steel stamping necessary for the mounting of this engine, it will enable you to go ahead on the sled.

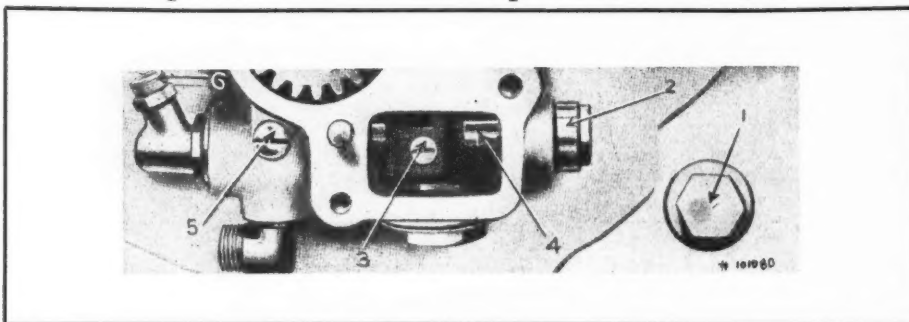
As the engine is complete within itself it will not be necessary to secure any special hub or to use any countershaft, as the propeller will be fastened directly onto the end of the stubshaft of the crankcase. A propeller suitable for this engine can be secured from any of the firms mentioned in the Winter Service issue.

CASTOR OIL BEST FOR LE RHONE ROTARY ENGINE

Q—What kind of oil can be used in a LeRhône rotary motor?—H. M. Strong, Provo, Utah.

The lubricant used almost exclusively in the LeRhône rotary engine is castor or blended castor oil. During the war the army air service made experiments with certain mineral oils for use in the LeRhône engine with fair success. The mineral oils used were built to the specifications of the army. It will be very difficult for you to secure mineral oil of that character so we would advise that you adhere to the castor or blended castor oil. Names of firms that will supply suitable lubricant will be given by separate letter.

Operation of Oil Pump on 1916 Indian



Q—Send complete instructions for taking down the motor of an Indian motor-cycle 1916 model, engine No. 74H-335 also diagram of engine driven oil pump.—Glen S. Stage, Ligonier, Ind.

We will gladly give you whatever information we have available in regard to the oil pump and would suggest that, for additional information, you either ask us some specific point or else get an instruction book from the Hendee Mfg. Company, Springfield, Mass.

Adjustment of Oil Pump on 1916 Indian

The Indian mechanical oil pump located on the right side of the motor base, is driven by worm gears off the main shaft. It positively delivers a fixed charge of oil to the engine, this quantity being proportionate to the speed, and also being variable to meet road conditions.

The pump is entirely automatic in its action, and is adjusted at the factory to feed sufficient oil for average operating conditions. Ordinarily, it will require no attention on the part of the operator, and will guarantee positive lubrication of the engine while there is oil in the tank.

When adjusted at the factory the pump is set to maintain the oil level in the engine about one-third way up on the motor base window indicator. The oil tank should be filled daily to insure ample lubrication for emergencies.

If the nature of the country in which the machine is being used makes it desirable to alter the pump adjustment to secure better lubrication, proceed by the following method: Referring to the illustration, unscrew caps 1 and 2. Loosen lock screw 3 and screw plunger 4 outward to shorten its stroke and cut down the amount of oil being fed to the motor.

To increase the oil supply, screw the plunger inward, which increases its stroke. In adjusting the pump, have motor running idle, and outlet pipe 6 disconnected so that the flow of oil passing through the pump can be watched. Do not change the plunger adjustment more than one turn at a time. After adjusting the pump, tighten lock screw, replace caps and ride machine a few miles, noting often how the oil level reads on the indicator glass.

Continuous smoke from the muffler indicates too much oil. Sluggishness of the motor and falling off in speed and power indicates insufficient oil. The pump can only fail under one condition—if the oil tank is allowed to become empty. When this occurs, the pump draws air, and an air lock forms which will prevent the passage of any more

oil until the air lock is relieved.

Therefore, after refilling an empty oil tank, remove screw 5 and run motor a few minutes until oil flows freely and regularly from this hole. Then replace screw, making sure that it is tight. If for any reason the supply pipe leading from the oil tank to the pump is disconnected, after reconnecting it, remove screw 5 and run motor to make sure that oil is passing through the pump.

WHAT HAVE YOU DONE ON FLAT RATE?

Q—In Motor Age the articles that are most interesting to me are those on the subject of Merchandising and Flat Rate, also Electrical problems. If possible I would like to see a discussion of flat rates giving time required by average workmen in a small shop for given operations. By this I mean in small shops doing electrical work where there is quite a variety and small opportunity to specialize on any one make.—Milton H. Lukens, Marblehead, Mass.

We are going to ask our readers to contribute their experiments for the benefit of each other. Here is a chance to tell what you have done to help along this important advance in the automobile electrical shop.

WHERE PISTON TRAVELS FARTHEST

Q—Is it true that the piston travels farther down on the first 90 degs. travel of the crank than it does on the second 90 degs?

1—Yes. This is shown in the illustration and it is evident that it is due to the fact that the crank in moving down half way also moves over to the right so that it pulls down an additional amount. When the crank rotates through the other half of its downward motion it is going in toward the center at the same time so that the amount of travel of the piston is proportionately reduced. The amount of variation will depend somewhat on the length of the connecting rod and on the stroke of the engine.

2—The question now arises if a person in timing the valves of a car by the travel of the piston in inches would not have some trouble due to this variation?

2—No. This condition should not cause any trouble in timing for it is usually necessary to check only the closing of the exhaust valve and opening of the intake valve which occurs so near to top dead center that this variation does not have to be considered seriously.

3—Could this condition not be overcome by offsetting the piston pin to the right?

3—This would not overcome the condition.

4—Explain why some car manufacturers offset piston pins and what the advantage is.

4—This is done in some cases in order to maintain the piston pressure always against one cylinder wall.

Why Spark Advance Is Needed

5—When the spark is advanced does the explosion occur at upper dead center or does it occur just a little past center and does the piston move faster than the spark or does the upward motion of the piston operate against the explosion for a fraction of an inch without a spark knock?

5—You apparently have the idea that the fuel in the engine fires instantaneously. This is not the case. It takes an appreciable fraction of a second for the flame to spread from the spark to all parts of the cylinder. It is for this reason that we advance the spark, for if the spark always occurred on dead center, the piston would be part way down on the firing stroke before it received the full force of the explosion and accordingly, some power would be lost.

It is true that the piston in the last bit of its upward travel is moving against the first portion of the pressure produced by the fuel starting to burn but, as the speed is high, the momentum of the fly-wheel and other moving parts is able to carry the piston against the explosive pressure. The piston then quickly gets to its dead center position and starts down at which time the maximum pressure is operating. Due to the fact that the piston does operate for an instant against the explosion pressure, it is possible to have a knock if the spark is advanced too much.

6—Give a few suggestions on how to overcome excessive gasoline consumption, as with valves and ignition timing correct and compression good we can only get 12 or 13 miles to the gallon on a Ford car.

6—The condition of the cylinders will have something to do with the mileage obtainable as well as the carburetor and its adjustment. Compression may appear to be good but there may be some leakage past the piston rings when the explosion takes place. Condition of the rear axle, as to how easily it turns, will also effect the mileage and you can get a general idea of how easily the car runs by trying to push it along the road. Tire inflation also has some effect in the mileage, and for best mileage the tires should be kept up to the recommended pressure.

7—Where can I get a book on the finer details of engine construction that would answer questions such as the first two? —George F. Ault, Iowa Subscriber, Swea City, Iowa.

7—Name of a book on automobile construction will be given by separate letter.

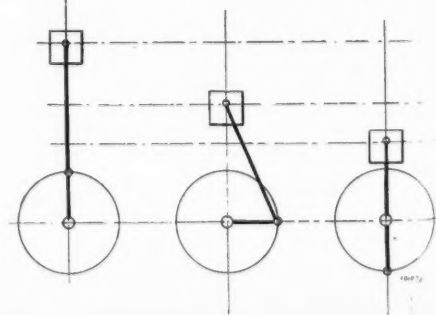
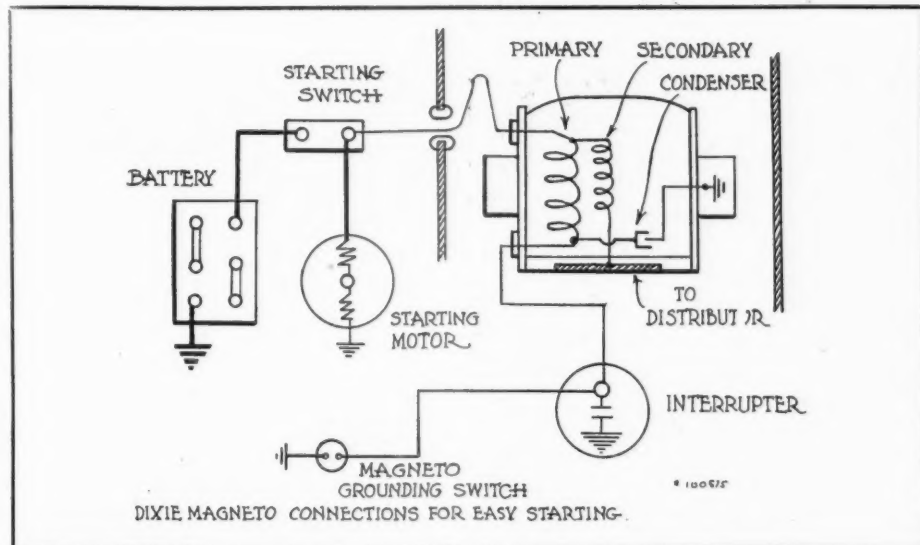


Diagram showing piston travel at different parts of its stroke

Adding a Battery Starting System to the Dixie Magneto



Q—Give instructions for wiring Splitdorf magneto and coil on Overland model 75. Give inside diagram of each. This magneto cuts out a hot spark at times but again is weak. Can you give remedy?

1—We are giving a diagram which shows the method occasionally used to get a hot spark from this Dixie magneto at cranking speed. To connect the magneto up in the manner shown, it is necessary to remove the side plates and put a hole in one of them, installing an insulated bushing of some sort in the hole so that the wire which goes through will not be cut by the plate.

One of the terminals on the coil will be seen to be grounded by means of a short copper strap and this copper strap should be disconnected and discarded. The wire shown going through the bushed hole in the side plate will then go from the starting switch to the coil terminal on which the ground strap was formerly used. In normal operation the magneto coil ground is obtained through the starting motor but when the starting switch is operated battery current not only flows to the starting motor but also flows through the primary winding of the magneto coil and through the interrupter to ground. This means that when starting the coil is operating just like a battery ignition coil. When the foot is taken from the starter switch however, the starting motor stops and serves as the ground while the magneto operates in normal fashion.

If trouble is experienced under normal conditions and the spark is not strong then the magneto should be overhauled. One possibility is that the magnets are weak. Another possibility is that the inductor is not properly timed with respect to the interrupter contacts.

To check this condition the magnets may be either removed or turned over to the side and the coil can be taken off. Then the rotating shaft should be turned in the normal direction until the points are just ready to open. At this time the inductor should have left the pole piece, leaving a gap of .040 inches.

2—What power will a model 75 Overland engine develop when used with a belt from the flywheel for stationary work?—Marrowbone Garage, C. B. Norris, Marrowbone, Ky.

2—This engine is a relatively high speed engine and should turn at 1400 or 1500 r.p.m. Automobile engines however, are not designed to give their full power continuously for when in a car the full power is not continuously required. We have no power curve on this particular engine but believe that it will safely develop 8 or 10 hp. continuously. However, best operation will be obtained by allowing it to do so at 1400 or 1500 r.p.m.

The question of whether the flywheel is the right diameter to use as a pulley will then have to be considered. To figure this you will have to know the speed at which the machine you are driving should run. Suppose for example that it should run at 500 r.p.m. while you want the engine to run at 1500 r.p.m. That means that the pulley on the machine that is being driven should be three times the size of the flywheel on the engine in order to give a 3 to 1 ratio with pulleys and belt.

OVERHAULED ENGINE WILL NOT IDLE PROPERLY

Answer the following questions immediately. We have a 37 A Oldsmobile touring car early 1921. We have overhauled this engine from one end to the other and the work was done by the most competent workmen in this locality. When new this engine would not idle properly with the stock equipment, a Johnson carburetor, nor will it now, although the compression is 90 per cent perfect at least. We have used a Marvel carburetor also the Ball & Ball atomizer as used on the Oakland all to no avail.

It will not hit on all cylinders running idle nor on the road when running at 5 miles an hour. The suction on the cylinders is as near alike as possible and the valves are in excellent condition and the valve stems are a good fit in the guides. When accelerating the motor it hits on all six cylinders. The carburetor is in good condition and there are no air leaks.

The ignition coil is new and we believe is not defective. The plugs are good and are set at .025 inches. The interrupter points are set at .020 inches. Remy battery ignition is used and the battery is

new. Could this trouble be caused by the design of the intake and exhaust pipe or manifold?—Fred McNary, Martinsville, Ill.

We are advised by the local Oldsmobile Service Station that the original equipment has been found to give most satisfactory results from a carburetor standpoint. It may be advisable however, to have the carburetor checked up by authorized service station handling this make and to set the low speed needle valve adjustment at $1\frac{1}{4}$ turns open for good operation when idling.

While it is not likely that the ignition is at fault it will do no harm to run the engine at slow speed with one high tension wire at a time removed from the spark plug and held within $\frac{1}{8}$ in. of the engine. The sparks should jump regularly and without missing and if missing occurs it would be well to try another coil, check up the interrupter points to see if they are burnt and see that there are no loose connections in the primary wiring. If the piston rings have not been changed within 9000 or 10,000 miles it is possible that there is a leakage past them, even though the compression appears to be good.

VALVE TIMING OF OVERLAND 90

Q—Would like to get some information on an Overland 90. There are no marks on the flywheel, so what degree does intake open? Does the open mean that the valve is clear open or is first starting to open? Give timing of ignition. Is it possible to give me the degrees in inches for the flywheel for it is not marked and have no way to measure degrees?—Ralph Baker, Toledo, Ohio.

There should be marks on the Overland flywheel, however we will give you the information that will enable you to time the engine without these marks. It will first be necessary to bring the engine up on the top of the exhaust stroke. When the piston is exactly on top center of exhaust stroke, turn the crankshaft slowly until a point $1\frac{13}{16}$ in. past center on the flywheel rim is in line with the punched indicating mark on the rear end of the cylinder block. The exhaust valve closes $1\frac{13}{16}$ in. flywheel travel after upper dead center. The inlet opens before the exhaust closes on this engine and should open at a point $\frac{63}{64}$ of an inch after upper dead center or in other words $\frac{13}{64}$ of an inch on the flywheel before the exhaust closes.

The push rod clearance should be .012.

NOTICE

Our reply to a letter from Alfred F. Bequette, San Jose, California, was returned undelivered. We will forward this reply if the complete address is supplied.

FLAT RATES

Page 37

This Week

BOOSTING ACCESSORY SALES

A CANVASS of accessory stores, immediately after Christmas has revealed the fact that those who tried, were rewarded. "Unusual" is the word most used by the dealers in describing the Christmas business done. Robes, novelties of all sorts, sold in great numbers to those who were making it an automotive Christmas. Next year, double the effort and the reward will also be doubled.

The Cooper Chevrolet Special (Muffler) Cutout is the regular Cooper Special with attachments as shown, readily adapting it for use on all Chevrolets. This was especially designed to meet the peculiar construction of the exhaust pipe on the Chevrolet by the Cooper Mfg. Co., Marshalltown, Ia.

The Ford Rubber Pedal Pads and Footrest are designed to fit over the metal pedal of the Ford controls. Two models, the Klampkite and the Regular, are made, the former selling at 75 cents for a set of three and the latter at 40 cents. The Restful Rubber Footpad is used on Fords equipped with accelerators and sells at 25 cents. The Midwest Rubber Co., E. 18 and Chester avenue, Cleveland, is the manufacturer.

The difficulty in solving the head lamp problem has to do with focusing the bulb in the lamp and in getting the rays of light to shine on the road rather than up into the tree tops. Various lenses have been made which are more or less effectual, and with lamp bulbs that vary, it means that the lamp should be focused whenever a bulb is replaced.

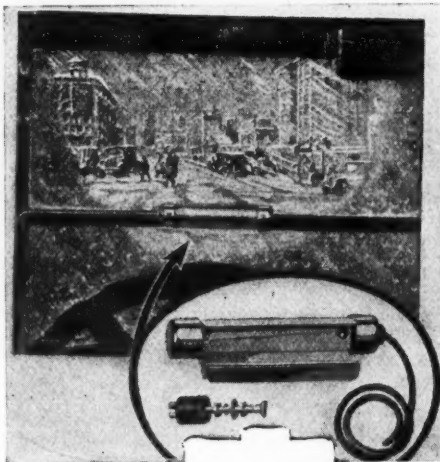
The Miniature Incandescent Lamp Corporation announces that its Tung-Sol Fixed Focus bulbs are made so exactly that one may replace another without the need of refocusing. It recommends using this type of bulb in the Flatlight reflector, which instead of a parabolic reflector uses one made with parallel fluted surfaces. This combination, it is said, gives a lamp which has been approved by those states having the largest car registrations.

The Colby Reversible Fan prevents the Ford engine from freezing in winter and over-heating in summer. It is interchangeable with the regular Ford fan and is easily installed. The fan blades can be reversed instantly by a slight pressure and a quick turn. No tools are required.

The Colby Reversible Fan is so constructed for reduction of friction. When the fan blades are reversed it directs a current of warm air to all parts of the radiator and at the same time prevents the cold air from entering, thus causing the engine to start quickly in cold weather and preventing freezing.

By reversing the air current it prevents engine, radiator and carburetor trouble in cold weather. The Colby Co., Lake Mills, Iowa.

The Tavelon Non-Skid Attachment, shown in the cut on this page is designed



Fulton electric windshield drier

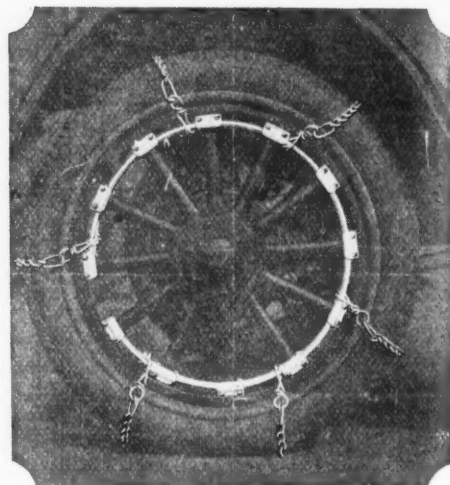


Colby reversible fan

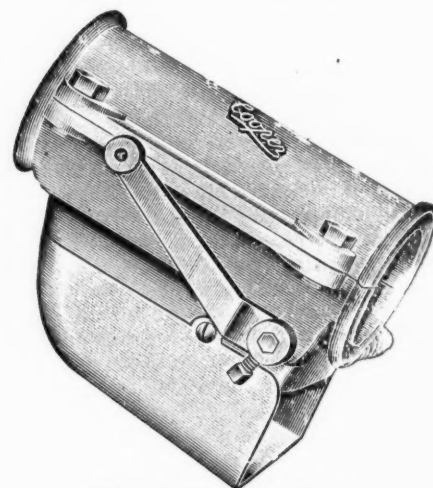
for driving on wet pavements, through muddy passages and for pulling out of holes. No jacking is necessary to install the Travelon. Pontiac Valve Co., which recently changed its corporate name to the Shaw-Walton Co., Pontiac, Ill., is the manufacturer.

The Fulton Electric Windshield Drier prevents the formation of frost and sleet on the windshield. It is an attractively designed nickel plated metal device connected to the car battery, and radiates heat just like an electric toaster. It warms the windshield just enough to rid it of moisture, and keep it clear, never enough heat to endanger the glass; never a burden on the battery. No moving parts. Simple in construction, easy to attach, can be used on any make of car. The price is \$3.50, The Fulton Co., Milwaukee, Wis.

From California, where mountain driving renders the gravity oiling system of motor cars inadequate, came the Ford Faithful Oiling System, designed by the W. O. Thompson Company of Pasadena, to afford relief not only from the troubles that arise due to hilly country, but other causes as well. Now the same company has further improved the system by the addition of a new transmission oiling device which is said to work very successfully.



Travel-On non-skid attachment

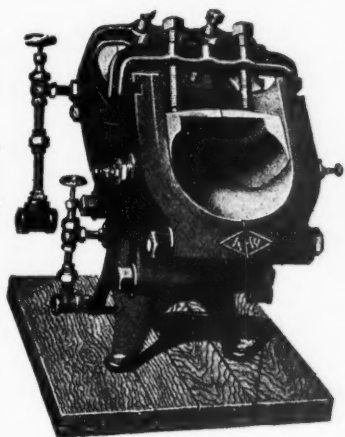


Cooper Chevrolet Cutout

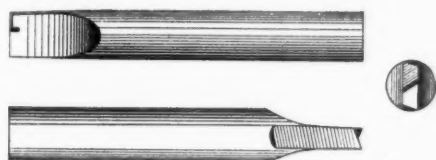
This is a device of simple construction which can be expected to work without getting out of order, and which insures proper oiling of transmission bands at all times. In some systems, there is always danger, in down hill driving, that the oil will gather at the front of the motor and leave the bands dry just when they are most in need of lubrication. The new device is an improved method of handling this problem in the Ford Faithful Oiling System, for even in earlier models it was taken care of.

To protect the front bearings, in up hill driving, the oil is gathered in a large pocket, which is an integral part of the inspection plate, where it is delivered to the front end of the motor through a large exterior tube. The angle of this tube is sufficient to insure adequate lubrication, regardless of driving conditions. There is consequently no danger of the oil all flowing to the rear and leaving the front bearings to burn out. Nor is there danger of scoring the cylinders and allowing the oil to leak past the pistons and form carbon, and necessitate frequent valve grinding and spark plug replacement. The system retails at \$5.75.

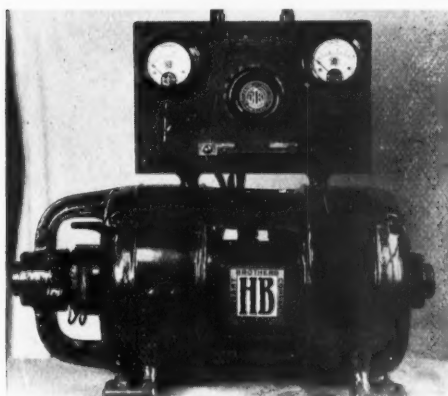
GETTING MORE OUT of the SHOP



Pneumatic truck tire sectional vulcanizer



Economy cutter

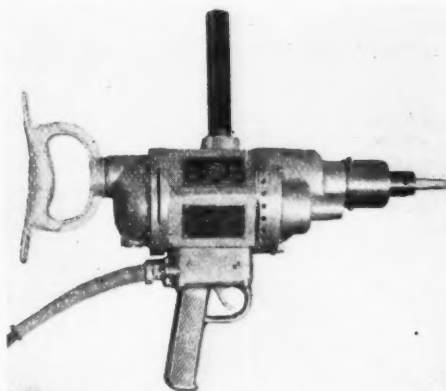


HB voltage regulating winding

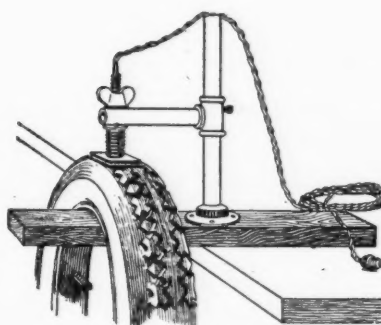
IF you have hesitated up to inventory time before renewing old equipment, don't let it go any farther. Over 4,000,000 cars were produced last year and that means that there are that many in service which will need expert maintenance and the shop that can take care of the work in an efficient manner, will get the business.

The day of the alley repairman has passed. Next year, new shops are going to crop out everywhere and the old ones that did not serve, will be out of the running. Few persons driving cars are in the least unwise any more. They know what to expect of their repairmen and they know what to pay for it.

The flat rate and new equipment will make the shop wind up '24 with a higher score.



Black & Decker portable electric screw driver



National spot patcher



Cooper Ford wheel puller

Economy cutters are of extremely simple design but are very efficient in rapidly cutting keyways, slots or oil grooves in any metal. The material used in these cutters is high speed steel, care being exercised in the hardening of them. They are made by the Economy Cutter Co., 50 Spring street, Newark, N. J.

The National Spot Patcher is a device for vulcanizing casings without removing them from the rim. It is also used for repairing tubes or curing patches on anything made of rubber. The patcher consists of a heating unit, operated by a 110-V. A. C. or D. C. current, which is mounted on a sliding standard so that it can be raised or lowered to accommodate the size of the article to be vulcanized. The curing area of the vulcanizer is two inches. It is supplied complete with

standard and cord. It is made by the National Equipment Co., 227 S. Balch Street, Akron, O.

To meet the demand for a heavier type Ford wheel puller, the Cooper Mfg. Co., Marshalltown, Ia., has brought out the Cooper Heavy Duty Ford Wheel Puller. The body of this tool is of malleable iron. It is fitted with a case hardened screw set, $\frac{3}{4}$ x 2 inches, for engaging the axle. The full and accurate threads on the inside are readily tightened by applying a wrench to the hex head cap screw which operates in the heavy slotted lug at the side.

The new HB Patented Voltage Regulating Winding, which, it is said, makes the machine proof against reversal, has been incorporated in the 125 ampere constant potential charging outfit made by Hobart Brothers of Troy, Ohio. This machine will handle from 10 to 22 batteries efficiently and is shipped complete with bus bars, connecting cable and switch board, so that it takes a minimum of time to set it up in the shop. The machine is shipped on 30 days trial and payments are extended over a period of twelve months.

The Pneumatic Truck Tire Sectional Vulcanizer is built on the split mold principle giving separate steam circulation to either side of the sectional cavity. This construction permits control of heat so as to allow live steam to enter one side of the cavity at a time, or both sides at once, and allows a side wall to be repaired without curing the opposite side of the casing. Two-screw clamp pressure, with one clamp applying on either half of the bead molds, insures even distribution of pressure. The Williams Foundry and Machine Co., 62 Cherry Street, Akron, O., is the manufacturer.

The Black and Decker Mfg. Co., Townson Heights, Baltimore, Md., announces a No. 3 Portable Electric Screw Driver and Socket Wrench for heavy duty production work. This tool, weighing 15 pounds, was designed especially for driving very large wood screws, lag screws and running up nuts on large bolts. The spindle is equipped with a positive clutch which automatically disengages when the forward pressure on the tool is released. The pistol grip and trigger switch are standard equipment on this tool. A universal motor furnishes the power and all standard voltages up to 250 volts can be supplied. This tool lists at \$88 in the United States and \$108 in Canada.

Watch MOTOR AGE for news of the New York and Chicago Shows. They are the buying barometers of the industry—particularly the Chicago Show. Forthcoming issues will contain all of the information on these two important events and will let you know what to expect this year.

SQUEEKS & RATTLES

NINETEEN-TWENTY-FOUR is Leap Year and most of us are going to have to do some tall leaping to keep out in front.

The ladies have carte blanche. And, since this is the Year when all ancient customs are thrown to the winds, someone has said that people will come in to you to buy cars.

Maybe so. But if you're going to rely upon people coming to you to buy, you'll find that they are playing leap frog past your door with the salesman from the other fellow's place.

The way to be sure, is to go out and play leap frog with them. Get in the game and when you get to your place, leap in.

And be sure the prospect leaps in behind you. Then, when you have him in, keep him leaping until he leaps into a car.

Then leap at him with the order blank. When he leaps out, be sure he has one of your cars underneath him.

Leap frog is a healthy game, only don't slip or the other guy will come down on your neck.

Motor Row Anthology

Through clouds I see The Row
Again. I see the wrecks
That trail those who talked
The most and the loudest
In life I never could talk when
Other dealers were there.
I could sell cars and did.
I made money, others lost
I got list price. I never
Traded without a profit
Never sold cars to dealers
Who could not sell the cars
In their home town.
Dealers must sell more cars
Or I did not want them
On my roster.
Men said I was foolish,
Not showy, did not expand.
I left my wife a full purse.
I made money for the factory.
I am content.

Actors Are Not Financiers

Glenn Hunter, star of "Merton of the Movies," bought a new car for Christmas and the other night, driving down Michigan avenue, mistook a bus for a public garage and tried to drive into it. The driver of the bus got out and they exchanged cards. "That's too bad, Mr. Hunter," said the driver, "that's a fine new car and it's a shame you had to smash it."

"Don't bother about that," said Glenn, "it isn't so bad—it's the fifth one I've had this year."

"Gee, if I had that much experience," said the driver, "I'd be able to do a hell of a lot better job than that—I had a Ford once and my first smash netted me the price of a Packard. You have a Packard and your fifth smash don't get you the price of a bicycle."



New Year comes but once a year but the installment on the income tax comes four times.

And since the saloonkeepers all had to go to work, we have no dependents to list on our return.

Whats Wrong Here?



Answer wherever the printer put it.

Typesetter, note: please set "help!" lines until this space is filled up. If that one about Glenn Hunter in the other column doesn't fill, don't blame me—actors are supposed to have a sense of humor.

Pre-Show Notes

The Association of Gas Saving Device Manufacturers announces that its members will tell the truth about their products at the show.

No one will have any revolutionary ideas.

No low priced cars will be announced.

No factory representatives will try to tell dealers how to do it.

No "short" speeches will be made.

Trade papers will not be asked to print stuff three years old and call it new.

No show will be held.

Weakly Korexpondens

editur squeex & ratels
deer lew

walnut korner ark

xept that h ford lost a voat from this town yestidy
ther aint much nus this wk. seems like hen dusenbery
was drivin his frod over to giv his gerl a shakin wen
the throtel jamd open an hen went by her hous hel-
bent not thinkin to thro the swich til he wus ten mile
away. tuk him 2 hrs tu fine the trubel & by that tim
his gerl hed gon ridin with peery tarbel & pery popped
the ? & she xcepted him.

ysr
axel stand

Answer to "What's Wrong Here?"

Never give a customer a light under any circumstances much less under those pictured here—sell him a cigar lighter.

Robert E. Lee of the St. Louis Automobile Dealers' Association gives this "sovereign prescription for certain business success in the New Year":

Aptly Applied Ambition.
Correctly Controlled Caution.
Eagerly Enthusiastic Earnestness.
Persuasively Prudent Persistency.

Mix well together, shake the bottle before taking and use in large doses. The effect will be "A Higher Score in '24'!"

LEW BRICATION.

Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES	
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear
Acme.....20	34-1		Co-N.....34x5	B&B.....Cot.	Ti-6250.	WO.....34x5n	34x5n			
Acme.....30	1-11		Co-J4.....34x5	B&B.....Cot.	Ti-6352.	WO.....34x3 1/2	34x5			
Acme.....40	1-11		Co-J4.....34x5	B&B.....Cot.	Ti-6160.	WO.....34x3 1/2	34x5			
Acme.....60	21-2		Co-K4.....44x5 1/2	B&B.....Cot.	Ti-6560.	WO.....36x4	36x7			
Acme.....90	21-2		Co-L4.....44x5 1/2	B&B.....Cot.	Ti-6660.	WO.....36x5	40x10			
Acme.....125	5-6 1/2		Co-B5.....44x6	B&B.....Cot.	Ti-6760.	WO.....36x6	40x12			
Amer. La France.....21	1-11	\$3950	Own.....44x6	Own.....Own.	Own.....DR.	36x4	36x7			
Amer. La France.....21	1-11	4950	Own.....44x6	Own.....Own.	Own.....Own.	WO.....36x5	36x5			
Amer. La France.....21	1-11	5500	Own.....44x6	Own.....Own.	Own.....Own.	WO.....36x6	40x6			
Armleder.....21	1-11		Bu-GTU.....44x5 1/2	Ful.....Ful.	Ti-6160.	WO.....34x3 1/2	34x6			
Armleder.....HVB	21		Bu-HTU.....44x5 1/2	B-L.....B-L.	Ti-6560.	WO.....36x4	36x4dk			
Armleder.....HWC	21		Co-CA.....44x5 1/2	B-L.....B-L.	Ti-6560.	WO.....36x4	36x4dk			
Armleder.....KWB	21		Bu-YTU.....44x5 1/2	B-L.....B-L.	Ti-6660.	WO.....36x5	36x5dk			
Armleder.....KWC	21		Co-E4.....44x5 1/2	B-L.....B-L.	Ti-6660.	WO.....36x5	36x5dk			
Atterbury.....20R	1-2	2475	Co-J4.....34x5	Ful.....Ful.	Ti-6160.	WO.....34x4	34x6			
Atterbury.....22C	1-2	3375	Co-K4.....44x5 1/2	B-L.....B-L.	Ti-6560.	WO.....36x4	36x4dk			
Atterbury.....22D	1-2	4275	Co-L4.....44x5 1/2	B-L.....B-L.	Ti-6660.	WO.....36x5	40x6dk			
Atterbury.....22E	5-6	4975	Co-B2.....44x6	B-L.....B-L.	Ti-6760.	WO.....36x6	40x7dk			
Autocar.....21	1-2	2200	Own.....44x4 1/2	Own.....Own.	Own.....DR.	34x4	34x6			
Autocar.....27	2-3	3450	Own.....44x5 1/2	Own.....Own.	Own.....DR.	34x5	36x8			
Autocar.....26	1-6	4650	Own.....44x5 1/2	Own.....Own.	Own.....DR.	34x6	36x12			
Available.....JH	1-2	2450	Ho-O.....14x5	B-L.....B-L.	Ti-6160.	WO.....36x3 1/2	36x5			
Available.....HJ	1-2	3160	Ho-O.....14x5	B-L.....B-L.	Ti-6560.	WO.....36x4	36x8			
Available.....HJ	1-2	4175	Ho-MU3.....44x5 1/2	B-L.....B-L.	Ti-6660.	WO.....36x5	40x5dk			
Available.....HJ	1-2	5375	Ho-T3.....54x6	B-L.....B-L.	Ti-6760.	WO.....36x6	40x12			
Avery.....1-1 1/4			Own.....34x4	Own.....Own.	To-OX2	IG.....34x5n	34x5n			
Bessemer.....G1	1450		Co-N.....34x5	Ful.....Ful.	To-A.....14x5	IG.....35x5n	35x5n			
Bessemer.....H2	1995		Co-N.....34x5	B&B.....Bak.	LM-7150	DR.....36x3 1/2	36x5			
Bessemer.....J2	2895		Co-C2.....44x5 1/2	B&B.....B-L.	LM-7250	DR.....36x4	36x4dk			
Bessemer.....K2	3495		Co-E7.....44x5 1/2	B&B.....B-L.	To-E.....14x5	IG.....36x5	36x10			
Bethlehem.....KN1	1985		Own.....34x5	B&B.....Det.	Ea-1000	SB.....35x5n	35x5n			
Bethlehem.....GN2	2185		Own.....44x5 1/2	B&B.....Det.	Wi-60A	DR.....34x4	34x6			
Bethlehem.....HN3	2985		Own.....44x5 1/2	Ful.....Ful.	Wi-88E	DR.....36x1	36x8			
Brackway.....E2	1450		Wi-SU.....44x5	B-L.....B-L.	Co-5200A	SB.....33x5n	33x5n			
Brackway.....S1	1450		Wi-SU.....44x5	B-L.....B-L.	Ti-6160.	WO.....36x4	36x6			
Brackway.....K2	1450		Co-K4.....44x5 1/2	B-L.....B-L.	Ti-6560.	WO.....36x4	36x8			
Brackway.....R2	1450		Co-L4.....44x5 1/2	B-L.....B-L.	Ti-6660.	WO.....36x5	36x5dk			
Brackway.....TS	1450		Co-B5.....44x6	B-L.....B-L.	Ti-6760.	WO.....36x6	40x7dk			
Buick.....23-4-SD	34	945	Own.....34x4 1/2	Own.....Own.	SB.....31x4n	31x4n				
Case.....TR2			Own.....44x5 1/2	TD.....Own.	To-C139	IG.....36x6n	38x7n			
Chevrolet Sup'r.....395			Own.....34x4	Own.....Own.	SB.....36x3 1/2	36x3 1/2				
Chevrolet Utl.....550			Own.....34x4	Own.....Own.	SB.....31x4n	34x4 1/2				
Clinton.....20	1-11	1980	Bu-WTU.....44x5 1/2	B-L.....B-L.	Ti-6250	WO.....34x5n	34x5n			
Clinton.....45	1-11	2810	Bu-YTU.....44x5 1/2	B-L.....B-L.	Ti-6460	WO.....34x4	34x3 1/2			
Clinton.....65	2-3	3180	Bu-ETU.....44x5 1/2	B-L.....B-L.	Ti-6560	WO.....34x5	34x5dk			
Clinton.....90	3-4	4160	Bu-YTU.....44x5 1/2	B-L.....B-L.	Ti-6660	WO.....36x6	36x6dk			
Clinton.....120	5-6 1/2	4890	Bu-BTU.....54x6 1/2	B-L.....B-L.	Ti-6760	WO.....36x6	40x7dk			
Clydesdale.....10A	1450	1785	Co-N.....34x5	B&B.....B-L.	Ti-6250	SB.....34x5n	34x5n			
Clydesdale.....8	2-3	2650	Co-K4.....44x5 1/2	B-L.....B-L.	Ti-6160	WO.....36x4	36x7			
Clydesdale.....6	2-3	3300	Co-L4.....44x5 1/2	B-L.....B-L.	Ti-6560	WO.....36x5	36x5dk			
Clydesdale.....4	2-3	4200	Co-B5.....44x6	B-L.....B-L.	Ti-6660	WO.....36x6	40x6dk			
Clydesdale.....2-6-7	4500		Co-B5.....44x6	B-L.....B-L.	Ti-6760	WO.....36x7	40x7dk			
Commerce.....9	1-1 1/4		Co-N.....34x5	Det.....Det.	Se-D16	SB.....33x5n	33x5n			
Commerce.....14	1-1 1/4		Co-J4.....34x5	B-L.....B-L.	Ti-6560	WO.....36x4	36x5dk			
Commerce.....25	2-3		Co-K4.....44x5 1/2	B-L.....B-L.	Ti-6560	WO.....36x4	36x7dk			
Corbett.....S	1450		HS-30.....34x5	B-L.....B-L.	Sh-1002	WO.....34x4 1/2	34x4 1/2			
Corbett.....E1	1450		Co-N.....34x5	B-L.....B-L.	Sh-1002	WO.....34x3 1/2	34x4dk			
Corbett.....D	1450		Co-J4.....34x5	B-L.....B-L.	Sh-1501	WO.....34x3 1/2	34x5dk			
Corbett.....C2	1450		Co-K4.....44x5 1/2	B-L.....B-L.	Sh-103	WO.....36x3 1/2	36x7dk			
Corbett.....B2	1450		Co-L4.....44x5 1/2	B-L.....B-L.	Sh-21	WO.....36x4	36x8			
Corbett.....R3	1450		Co-L4.....44x5 1/2	B-L.....B-L.	Sh-32	WO.....36x5	36x10			
Corbett.....A	3-4		Co-B5.....44x6	Det.....Det.	Sh-51	WO.....36x6	40x12			
Corbett.....AA5	1450		Bu-WTU.....44x5 1/2	B-L.....B-L.	Ti-6352	WO.....34x3 1/2	34x5			
Day-Elder.....AN	1450		Co-J4.....34x5	B-L.....B-L.	Ti-6160	WO.....34x3 1/2	34x5			
Day-Elder.....BN2	1450		Co-K4.....44x5 1/2	B-L.....B-L.	Ti-6560	WO.....36x4	36x8			
Day-Elder.....DN2	1450		Co-L4.....44x5 1/2	B-L.....B-L.	Ti-6660	WO.....36x5	36x5dk			
Day-Elder.....CN3	1450		Bu-HTU.....44x5 1/2	B-L.....B-L.	Ti-6560	WO.....36x4	36x8			
Day-Elder.....FN1	1450		Co-L4.....44x5 1/2	B-L.....B-L.	Ti-6660	WO.....36x5	36x5dk			
Day-Elder.....EN5-6	1450		Bu-YTU.....44x5 1/2	B-L.....B-L.	Ti-6760	WO.....36x6	40x6dk			
Dearborn.....E1	1600		Bu-Mu.....34x5 1/2	Ful.....Ful.	Wi.....WO.	35x5n	35x5n			
Dearborn.....F1	1980		Bu-WU.....34x5 1/2	Ful.....Ful.	Wi.....WO.	34x4	34x5			
Dearborn.....48	2390		Bu-WU.....34x5 1/2	Ful.....Ful.	Wi.....WO.	34x4 1/2	34x7			
Denby.....31	1-1 1/4	1485	Co-N.....34x5	Ful.....Ful.	Cl-B300*	SB.....34x5n	34x5n			
Denby.....33	2375		Co-J4.....34x5	Ful.....Ful.	Cl-1D	IG.....35x5n	38x7n			
Denby.....35	2975		Co-K4.....44x5 1/2	Ful.....Ful.	Cl-2D	IG.....36x4	36x8			
Denby.....27	3695		Co-L4.....44x5 1/2	Ful.....Ful.	Cl-3D	IG.....36x5	36x5dk			
Denby.....210	4295		Co-B5.....44x6	Ful.....Ful.	Cl-5D	IG.....36x6	40x6dk			
Denby.....214	4945		Co-B5.....44x6	Ful.....Ful.	Ru.....IG.	36x6	40x14			
Dependable.....CD	1-2	2350	Bu-CTU.....34x5 1/2	Ful.....Ful.	Wi-800J	WO.....34x5	34x8			
Dependable.....EG	2-3	2950	Bu-ETU.....44x5 1/2	Ful.....Ful.	Wi-900C	WO.....36x5	36x10			
Diamond T.....75	1-1 1/4		He-O.....4x5	Cov.....Cov.	Co-52021	SB.....33x5n	33x5n			
Diamond T.....03	1-1 1/4		Hi-700.....34x5 1/2	Cov.....Cov.	Own.....Own.	WO.....36x3 1/2	36x4			
Diamond T.....T1	1450		Hi-700.....34x5 1/2	Cov.....Cov.	Ti-6460	WO.....36x3 1/2	36x5			
Diamond T.....U2	2145		Hi-1400.....44x5 1/2	Cov.....Cov.	Ti-6560	WO.....36x4	36x8dk			
Diamond T.....K	3145		Hi-1500.....44x5 1/2	Cov.....Cov.	Ti-6660	WO.....36x5	36x5dk			
Diamond T.....EL5	3145		Hi-200.....44x5 1/2	Cov.....Cov.	Ti-6760	WO.....36x6	40x6dk			
Diamond T.....S5	3145		Hi-B2.....44x6	B-L.....B-L.	Ti-6760	WO.....36x6	40x6dk			
Dodge Brothers.....34	730		Own.....37x8 1/2	Own.....Own.	Own.....Own.	SB.....32x4n	32x4n			
Dorris.....K2	1	\$2490	Own.....44x5 1/2	Own.....Own.	War.....Ti-5512	IG.....33x5n	33x5n			
Dorris.....K4	1	3400	Own.....44x5 1/2	Own.....Own.	War.....Ti-5560	WO.....36x4	36x7			
Dorris.....K7	1	4400	Own.....44x5 1/2	Own.....Own.	War.....Ti-6990	WO.....36x7	36x10			
Dort.....109	6850		Ly-K.....34x5	Del.....Del.	Own.....Ti-105	SB.....31x4n	31x4n			
Duplex.....G1	1450		Bu-WTU.....44x5 1/2	B-L.....B-L.	Ti-5511	SB.....33x5	33x5n			
Duplex.....GH	1450		Bu-WTU.....44x5 1/2	B-L.....B-L.	Cov.....Sh-1501	WO.....35x5	35x6			
Duplex.....AC	1450		Hi-400.....44x5 1/2	Cov.....Cov.	Sh-103	WO.....35x5n	35x7n			
Duplex.....E	1450		Hi-400.....44x5 1/2	B-L.....B-L.	Vu-4	WO.....34x5	36x8			
Duplex.....E	1450		Bu.....44x5 1/2	B-L.....B-L.	Own.....IG.	36x8	36x8			
F.W.D.....B3	4200		Wi-A.....44x5 1/2	H-S.....Cot.	Own.....SP.	36x4	36x6			
Fagel.....14	3000		Wa-YA.....44x5 1/2	B-L.....B-L.	Ti-6461	WO.....34x3 1/2	34x6			
Fagel.....21	3900		Wa-CU.....44x5 1/2	B-L.....B-L.	Ti-6560	WO.....34x4	36x7			
Fagel.....21	5000		Wa-DU.....44x5 1/2	B-L.....B-L.	Ti-6660	WO.....36x5	36x5dk			
Fagel.....21	5700		Wa-DU.....44x5 1/2	B-L.....B-L.	Ti-6760	WO.....36x6	40x6dk			
Federal.....R2	1450		Co-J4.....34x5	B&B.....Det.	Ti-6250	WO.....33x5n	33x5n			
Federal.....U2	1450		Co-J4.....34x5	B&B.....Det.	Ti-6460	WO.....36x3 1/2	36x5			
Federal.....W2	1450		Co-K4.....44x5 1/2	B&B.....Det.	Ti-6560	WO.....36x4				

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Kissel.....	4	\$3625	Own	4 1/2 x 5 1/2	War.	War.	Sh-31.....	WO.	36x5	36x12
Larrabee.....	X2	1785	Co-SIL.....	3 3/8 x 4 1/2	B-L.	B-L.	Sh-1480.....	SB.	34x5n	34x5n
Larrabee.....	J4	2400	Co-J4.....	3 3/8 x 5	B-L.	B-L.	Sh-1501.....	WO.	34x3 1/2	34x5k
Larrabee.....	K5	3550	Co-L4.....	4 1/2 x 5 1/2	B-L.	B-L.	Sh-22.....	WO.	36x4	36x8
Larrabee.....	L4	4100	Co-L4.....	4 1/2 x 5 1/2	B-L.	B-L.	Sh-31.....	WO.	36x5	36x10
Maccar.....	EX	11 1/2	Wi-SU.....	4x5	B-L.	B-L.	Sa-1526e.....	SB.	34x5n	34x5n
Maccar.....	L-1	11 1/2	Wi-TAU.....	4x6	B-L.	B-L.	TI-6460.....	WO.	36x4	36x6
Maccar.....	HT	11 1/2	Wi-TAU.....	4x6	B-L.	B-L.	TI-6560.....	WO.	36x4	36x4d
Maccar.....	H-13	11 1/2	Wi-UAU.....	4x6	B-L.	B-L.	TI-6560.....	WO.	36x4	36x4d
Maccar.....	M-24	11 1/2	Wi-UAU.....	4x6	B-L.	B-L.	TI-6666.....	WO.	36x5	36x6d
Maccar.....	G-15	11 1/2	Wi-RBU.....	5x6	B-L.	B-L.	TI-6760.....	WO.	36x6	40x6d
MacDonald.....	O-3-5	5500b	Bu-WTU.....	3 3/4 x 5 1/2	B-L.	B-L.	**Own.....	IG.	36x6	36x10
MacDonald.....	A-7 1/2	8000b	Bu-YTU.....	4 1/2 x 6	B-L.	B-L.	**Own.....	IG.	40x7	40x14
Mack.....	AB	3000	Own	4x5	Own	Own	Own	Ch.	36x4	36x3 1/2
Mack.....	AB	3450	Own	4x5	Own	Own	Own	Ch.	36x4	36x3 1/2
Mack.....	AB	3300	Own	4 1/2 x 5	Own	Own	Own	Ch.	36x4	36x4d
Mack.....	AB	3750	Own	4 1/2 x 5	Own	Own	Own	Ch.	36x4	36x4d
Mack.....	AB	3400	Own	4 1/2 x 5	Own	Own	Own	Ch.	36x4	36x4d
Mack.....	AB	3850	Own	4 1/2 x 5	Own	Own	Own	Ch.	36x4	36x4d
Mack.....	AC	4950	Own	5x6	Own	Own	Own	Ch.	36x5	40x5d
Mack.....	AC	5500	Own	5x6	Own	Own	Own	Ch.	36x6	40x6d
Mack.....	AC	5750	Own	5x6	Own	Own	Own	Ch.	36x6	40x12
Mack.....	AC	6000	Own	5x6	Own	Own	Own	Ch.	36x7	40x7d
Mack.....	AB	3400	Own	4 1/2 x 5	Own	Own	Own	Ch.	36x4	36x4d
Mack.....	AC	4950	Own	5x6	Own	Own	Own	Ch.	36x5	40x5d
Mack.....	AC	5500	Own	5x6	Own	Own	Own	Ch.	36x6	40x6d
Mack.....	AC	5750	Own	5x6	Own	Own	Own	Ch.	36x6	40x12
Mack.....	AC	6000	Own	5x6	Own	Own	Own	Ch.	36x7	40x7d
Mason.....	11 1/2	1295	He.....	4x5	Hoo.	War.	FL.....	SB.	34x5n	34x5n
Master.....	11 1/2	11 1/2	Bu-WTU.....	3 3/4 x 5 1/2	Ful.	Ful.	TI-5511.....	SB.	33x5n	33x5n
Master.....	21 1/2	11 1/2	Bu-OU.....	4 1/2 x 5 1/2	Ful.	Ful.	TI-6460.....	WO.	34x4	34x6
Master.....	41 1/2	11 1/2	Bu-ETU.....	4 1/2 x 5 1/2	Ful.	Ful.	TI-6560.....	WO.	34x4	36x8
Master.....	51 1/2	11 1/2	Bu-YTU.....	4 1/2 x 6	B-L.	B-L.	TI-6666.....	WO.	36x5	40x10
Master.....	61 1/2	11 1/2	Bu-YTU.....	4 1/2 x 6	B-L.	B-L.	TI-6760.....	WO.	36x5	40x12
Master.....	64 1/2	11 1/2	Bu-ATU.....	4 1/2 x 6 1/2	B-L.	B-L.	TI-6760.....	WO.	36x6	40x14
Maxwell.....	11 1/2	1097	Own	3 3/4 x 4 1/2	Own	Own	TI.....	WO.	35x5n	35x5n
Menominee.....	B	1650	Wi-SU.....	4x5	B&B.	Det.	Co-5200.....	SB.	35x5n	35x5n
Menominee.....	HT	2000	Wi-CAU.....	3 3/4 x 5	Ful.	Det.	Wi-800G.....	WO.	34x3 1/2	36x5k
Menominee.....	B-31	2475	Wi-EAU.....	4x5	Ful.	Det.	Wi-800H.....	WO.	36x3 1/2	36x5k
Menominee.....	D-2 1/2	2875	Wi-TAU.....	4x6	Ful.	Det.	Wi-800J.....	WO.	36x4	36x8
Menominee.....	J-5	4850	Wi-RAU.....	4x6	B&B.	Det.	TI-6760.....	WO.	36x6	40x12
Moline.....	10 1/2	1695	Own	3 1/2 x 5	B&B.	Own	To-A.....	IG.	34x5n	36x6n
Nash.....	2018	1595	Own	3 1/2 x 5 1/2	B&B.	Det.	CL-1D.....	IG.	34x4	34x5
Nash.....	4017F	2750	Bu-HU.....	4 1/2 x 5 1/2	B&B.	Own	Own	IG.	36x6	36x6
Nash.....	3018	2150	Own	3 3/4 x 5 1/2	B&B.	Det.	CL-2D.....	IG.	34x4	34x7
Nash.....	5018	2250	Own	3 3/4 x 5 1/2	B&B.	Det.	CL-2D.....	IG.	34x4	34x7
Noble.....	A-75	1395	Bu-WTU.....	3 3/4 x 5 1/2	Ful.	Ful.	CL-300.....	SB.	34x4 1/2	34x4 1/2
Noble.....	A-21	1890	Bu-WTU.....	3 3/4 x 5 1/2	Ful.	Ful.	Sh-1501.....	WO.	34x5	34x5
Noble.....	B-31	2695	Bu-CTU.....	3 3/4 x 5 1/2	Ful.	Ful.	Sh-103.....	WO.	36x4	36x7
Noble.....	D-51	3150	Bu-ETU.....	4 1/2 x 5 1/2	Ful.	Ful.	Sh-21.....	WO.	36x4	36x8
Noble.....	E-71	3850	Bu-YTU.....	4 1/2 x 6	Ful.	War.	Sh-30.....	WO.	36x5	36x10
Old Reliable.....	B	3500	Wi-UAU.....	4x6	Ful.	Ful.	Sh-21.....	WO.	34x4	36x8
Old Reliable.....	C	4250	Wi-UAU.....	4x6	Ful.	Ful.	Sh-31.....	WO.	36x5	36x12
Old Reliable.....	D	5000	Wi-RAU.....	4x6	Own	B-L.	Sh-51.....	WO.	36x6	40x12
Old Reliable.....	K	6000	Wa-P.....	4 1/2 x 6 1/2	Own	Own	Ch.....	36x6	40x14	
Oldsmobile.....	T	1095	Own	3 1/2 x 5 1/2	B&B.	War.	To-OXZL.....	IG.	35x5n	35x5n
Oneida.....	B	2825	Hi-400.....	4x5 1/2	Ful.	Ful.	Wi-800J.....	WO.	36x3 1/2	36x7
Oneida.....	C	3200	Hi-400.....	4x5 1/2	Ful.	Ful.	Wi-900C.....	WO.	36x4	36x7
Oneida.....	D	4050	Hi-200.....	4 1/2 x 5 1/2	Ful.	Ful.	TI-6652.....	WO.	36x5	36x10
Overland.....	91ce	395	Own	3 1/2 x 4	B&B.	Own	Own	SB.	36x3 1/2	36x3 1/2
Patriot, Revere.....	1	1350	Co-N.....	3 3/4 x 5	B&B.	Cov.	TI-6250.....	WO.	35x5n	35x5n
Patriot, Lincoln.....	2	2400	Hi-100.....	4x5 1/2	Cov.	Ful.	TI-6560.....	WO.	34x4k	34x4k
Pat., Washington.....	3	3000	Hi-200.....	4 1/2 x 5 1/2	Cov.	Cov.	Wi-900.....	WO.	36x5k	36x8k
Pierce Arrow, XA.....	2	3300	Own	4x5 1/2	Own	Own	Own	WO.	36x4	36x5d
Pierce Arrow, XB.....	3	3500	Own	4x5 1/2	Own	Own	Own	WO.	36x5	36x5d
Pierce Arrow, WC.....	4	4600	Own	4 1/2 x 6 1/2	Own	Own	Own	WO.	36x6	36x6d
Pierce Arrow, WD.....	5	4700	Own	4 1/2 x 6 1/2	Own	Own	Own	WO.	36x6	36x7
Pierce Arrow, RE.....	6	5100	Own	4 1/2 x 6 1/2	Own	Own	Own	WO.	36x6	40x7d
Pierce Arrow, RF.....	7 1/2	5200	Own	4 1/2 x 6 1/2	Own	Own	Own	WO.	36x6	40x8d
Rainier.....	R31	.....	Co-N.....	3 3/4 x 5	B-L.	B-L.	TI-6250.....	WO.	35x5n	35x5n
Rainier.....	R29	.....	Co-N.....	3 3/4 x 5	B-L.	B-L.	TI-6250.....	WO.	34x3 1/2	34x4
Rainier.....	R36	.....	Co-J4.....	3 3/4 x 5	B-L.	B-L.	TI-6460.....	WO.	34x3 1/2	34x5
Rainier.....	R28	.....	Co-K4.....	4 1/2 x 5 1/2	B-L.	B-L.	Sh-103.....	WO.	34x4	34x5
Rainier.....	R20	.....	Co-K4.....	4 1/2 x 5 1/2	B-L.	B-L.	TI-6560.....	WO.	36x4	36x8
Rainier.....	R25	.....	Co-L4.....	4 1/2 x 5 1/2	B-L.	B-L.	TI-6666.....	WO.	36x5	36x5d
Rainier.....	R27	.....	Co-B5.....	4x6	B-L.	B-L.	TI-6760.....	WO.	36x6	40x6d
Reo.....	F	1185	Own	4 1/2 x 4 1/2	Own	Own	Own	SB.	34x4 1/2	34x4 1/2
Reo.....	F	1485b	Own	4 1/2 x 4 1/2	Own	Own	Own	SB.	33x4 1/2	33x4 1/2
Republic.....	75	.....	Ly-CT.....	3 3/4 x 5	Ful.	Ful.	To-750.....	IG.	33x5n	33x5n
Republic.....	11X	.....	Co-J4.....	3 3/4 x 5	Ful.	Ful.	To-CT2.....	IG.	34x4	34x6
Republic.....	19W	.....	Wa-FU.....	4x5 1/2	Ful.	Ful.	To-CT2.....	IG.	36x4	36x8
Republic.....	19	.....	Co-K4.....	4 1/2 x 5 1/2	Ful.	Ful.	To-CT2.....	IG.	36x4	36x8
Republic.....	20	.....	Co-L4.....	4 1/2 x 5 1/2	Ful.	Ful.	To-E.....	IG.	36x5	36x10
Rowe.....	CW	3000	Wi-CAU.....	3 3/4 x 5	B-L.	B-L.	Sh-1501.....	WO.	36x6n	36x6n
Rowe.....	CDW	3300	Wi-CAU.....	4x5	B-L.	B-L.	Sh-103.....	WO.	34x5	36x3 1/2
Rowe.....	CDW	.....	Wi-NU.....	4 1/2 x 5	B-L.	B-L.	Sh-21.....	WO.	34x5	36x4d
Rowe.....	GSW	4150	Wi-TAU.....	4x6	B-L.	B-L.	Sh-21.....	WO.	34x6	36x5d
Rowe.....	HW	4500	Wi-UAU.....	4x6	B-L.	B-L.	Sh-31.....	WO.	36x7	36x8d
Rowe.....	FW	4850	Wi-UAU.....	4x6	B-L.	B-L.	Sh-51.....	WO.	36x7	40x6d
Ruggles.....	15	895	HS.....	3 1/2 x 5	M&E	Ful.	Co.....	SB.	32x4 1/2	32x4 1/2
Ruggles.....	20R	.....	Own	4x5	B-L.	B-L.	Co-5200.....	SB.	34x5n	34x5n
Ruggles.....	40	.....	Own	4x5	B-L.	B-L.	Wi-65.....	DR.	34x5n	34x5n
Ruggles.....	40H	.....	Own	4x5	B-L.	B-L.	Wi-88E.....	DR.	36x4	36x8
Sandw., CG&G.....	1	1795	Co-N.....	3 3/4 x 5	Ful.	Ful.	Sh-1501.....	WO.	34x3 1/2	34x5
Sandw.....	2 1/2	2750	Co-C4.....	4 1/2 x 5 1/2	B-L.	B-L.	TI-6560.....	WO.	36x4	36x7
Sandw.....	M	4325	Co-B5.....	4x6	B-L.	B-L.	TI-6760.....	WO.	36x6	40x12
Sanford.....	10 1/2	.....	Co-SR.....	3 3/4 x 4 1/2	B&B.	B-L.	Sa-D.....	SB.	33x5n	33x5n
Sanford.....	15 1/2	.....	Co-N.....	3 3/4 x 5	B-L.	B-L.	Sh-1501.....	WO.	36x3 1/2	36x5k
Sanford.....	25 1/2	.....	Co-C4.....	4 1/2 x 5 1/2	B-L.	B-L.	Sh-21.....	WO.	36x4	36x4d
Sanford.....	35 1/2	.....	Co-E4.....	4 1/2 x 5 1/2	B&B.	B-L.	Sh-31.....	WO.	36x5	36x5d
Sanford.....	50 1/2	.....	Co-E4.....	4 1/2 x 5 1/2	B&B.	B-L.	Sh-31.....	WO.	36x5	40x6d
Schacht										

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	ENGINE				REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	ENGINE				REAR AXLE		TIRES			
		Price	Make & Model	Bore & Strokes	Clutch Make	Gearset Make	Make & Model	Final Drive	Front			Rear	Price	Make & Model	Bore & Strokes	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear
Gottfredson...20	¾-1	\$2275	Bu-WTU	3½x5½	B-L.	B-L.	Tt-6250.	W.O.	34x5n	34x5n	National....FA	1	\$2450	Wa-BUX	3½x5½	B-L.	B-L.	Tt-6352.	W.O.	35x5n	35x5n
Gottfredson...40	1¼-2	3290	Bu-GTU	4x5½	B-L.	B-L.	Tt-6400.	W.O.	36x6n	38x7n	National....GA	1½	2750	Wa-BUX	3½x5½	B-L.	B-L.	Tt-6400.	W.O.	34x4k	34x6k
Gottfredson...50	2½-3	3775	Bu-Etu	4½x5½	B-L.	B-L.	Tt-6500.	W.O.	36x4	36x6	National....HD	2	3750	Wa-CU.	4½x5½	H-S.	B-L.	Tt-6500.	W.O.	36x5	36x10
Gottfredson...80	4	4775	Bu-YTU	4½x6	B-L.	B-L.	Tt-6600.	W.O.	34x5	36x12	National....NB	3	4750	Wa-DU.	4½x6½	H-S.	B-L.	Tt-6600.	W.O.	36x6	36x12
Gottfredson...100	5	5800	Bu-BTU	5x6½	B-L.	B-L.	Tt-6700.	W.O.	36x6	40x14	National....OA5	5	6150	Wa-EU.	5x6½	H-S.	B-L.	Tt-6700.	W.O.	36x6	40x14
Mapleleaf....1¼		3000	Hi-300	3½x5½	Ful.	Ful.	Sh-1501.	W.O.	34x5n	36x6n	Veteran....M1	¾	2899	Ba-CTU	3½x5½	B&B.	Cot.	Sh-1501.	W.O.	34x5n	34x5n
Mapleleaf....AA 2		3600	Hi-400	4x5½	Ful.	Ful.	Sh-103.	W.O.	36x4	36x7	Veteran....P2	2	3699	Ba-HTU	4½x5½	B&B.	Cot.	Sh....	W.O.	36x4	36x7
Mapleleaf....BB 3		4050	Hi-500	4½x5½	Ful.	Ful.	Sh-21.	W.O.	36x4	36x1d	Veteran....R3	3	4200	Ba-HTU	4½x5½	B&B.	Cot.	Sh-21....	W.O.	36x4	36x7
Mapleleaf....CC 4		4800	Hi-200	4½x5½	Ful.	Ful.	Sh-31.	W.O.	36x5	36x5d	Veteran....S4	4	5395	Bu-YTU	4½x6	B&B.	Cot....	Sh-31....	W.O.	36x5	36x10
Mapleleaf....DD 5		5625	Hi-1600.	4½x5½	Ful.	Ful.	Sh-51.	W.O.	36x6	36x6d											

MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 In. Plovs	Price	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 In. Plovs	Price	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 In. Plovs	Price	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)
				Make	No. of Cyls. Bore & Stroke							Make	No. of Cyls. Bore & Stroke							Make	No. of Cyls. Bore & Stroke		
Allis-Chalmers...	6-12	1	\$325	LeR.	4-3 1/2 x 4 1/2	2500	48x 6	Gray.....EU	22-40	4	2385	Wau.	4-5 x 6 1/2	6900	†	Rumely OilPull..E	30-60	8-10	.....	Own.	2-10x12	26000	80x30
Allis-Chalmers...	15-25	3	1285	Mid.	4-4 x 5 1/2	4700	46x12									Russell.....	15-30	3-4	.....	Ch.	4-5 x 6 1/2	6900	56x14
Allis-Chalmers...	20-35	4	1885	Own.	4-4 1/2 x 6 1/2	6150	50x12									Russell.....	20-40	4-5	.....	Ch.	4-5 1/2 x 7	7000	60x16
Allwork.....D	30-38	4-5	1695	Own.	4-5 x 7	6500	48x14	Hart-Parr.....20	-20	2	.....	Own.	2-5 1/2 x 6 1/2	4250	46x10	Russell.....	30-60	8-10	.....	Own.	4-8 x 10	22550	84x22
Allwork.....C	16-30	3	1295	Own.	4-5 x 6	5200	48x12	Hart-Parr.....(Road)	-30	3	.....	Own.	2-6 1/2 x 7	5220	52x10								
Aultman-Taylor...	15-30	3-4	1900	Ch.	4-5 x 6 1/2	4800	48x12	Hart-Parr.....40	-40	4	.....	Own.	4-6 1/2 x 6 1/2	7510	32x18	Shaw-Enochs (Gr.)	30-60	8-10	.....	LeR.	4-3 1/2 x 4 1/2	4400	48x22
Aultman-Taylor...	22-45	4-6	3100	Own.	4-5 1/2 x 8	12500	70x20	Heider.....D	9-16	2	.....	Wau.	4-4 1/2 x 5 1/2	4500	54 x 8	Topp-Stewart...B	30-45	4	.....	Wau.	4-4 1/2 x 6 1/2	7800	42x12
Aultman-Taylor...	30-60	8-10	4400	Own.	4-7 x 9	22500	90x24	Heider.....C	12-20	3	.....	Wau.	4-4 1/2 x 6 1/2	6000	57x10	Toro.....	10-20	2	\$675	LeR.	4-3 1/2 x 4 1/2	2900	41x 9
Avery.....15-30	3-4	1	.....	Own.	4-4 1/2 x 6	4750	50x12	Heider.....M-2	5-10	3	.....	LeR.	4-3 1/2 x 4 1/2	2800	48 x 6	Townsend.....	10-20	2-3	.....	Own.	2-6 1/2 x 7	4500	48x12
Avery.....20-35	3-4	1	.....	Own.	4-4 1/2 x 7	7500	60x16	Huber.....(Light 4)	12-25	3	985	Wau.	4-4 1/2 x 5 1/2	5000	60x10	Townsend.....	15-30	3-4	1350	Own.	2-7 x 8	6500	56x18
Avery.....25-50	5-6	1	.....	Own.	4-6 1/2 x 7	12500	69x20	Huber.....(Super 4)	15-30	3	.....	Mid.	4-4 1/2 x 6	6000	60x10	Townsend.....	25-50	4-8	2250	Own.	2-8 x 8	11500	60x24
Avery.....45-65	8-10	1	.....	Own.	4-7 1/2 x 8	22000	87 1/2 x 24									Traylor.....	6-12	1	.....	500 LeR.	4-3 1/2 x 4 1/2	1750	38x10
Avery, Tr. Runner	.....	3	.....	Own.	4-4 x 5 1/2	4000	x 8 1/2	Lauson.....T	12-25	3	.....	Mid.	4-4 1/2 x 5 1/2	4200	.....	Twin City.....	12-20	3	1200	Own.	4-4 x 6	4700	50x12
Avery, RoadRazer	.....	.....	.....	Own.	6-3 x 4	5600	42x 6	Lauson.....T	15-30	4	.....	Bea.	4-4 1/2 x 6	6500	.....	Twin City.....	20-35	5	2750	Own.	4-5 1/2 x 6	8400	60x20
Bates (St. Mule) H	15-25	3	.....	Mid.	4-4 1/2 x 6 1/2	3600	49x10	Leader.....B	12-18	2	.....	Own.	2-6 1/2 x 6	4800	50x12								
Bates (St. Mule) F	18-25	3	.....	Mid.	4-4 1/2 x 6 1/2	4850	56x10	Leader.....N	16-32	3-4	1275	Ch.	4-5 x 8	5800	52x12	Uncle Sam.....C-20	12-20	2-3	.....	Her.	4-4 x 5	3000	46x12
Bates (St. Mule) G	25-35	4	.....	Mid.	4-4 1/2 x 6	6500	56x10	Lincoln.....A	15-30	3	1800	Bud.	4-4 1/2 x 6	5000	40x14	Uncle Sam.....B-19	20-30	3-4	.....	Bea.	4-4 1/2 x 6	4650	50x12
Bates (St. Mule) 40	30-40	4	.....	Mid.	4-4 1/2 x 6	8500	58x12	Little Giant...B	16-22	4	.....	Own.	4-5 1/2 x 6	8700	66x20	Uncle Sam.....D-21	20-30	3-4	.....	Bea.	4-4 1/2 x 6	4600	50x12
Bear.....B	25-35	4	\$250	Ste.	4-4 1/2 x 6 1/2	6000	61x11 1/2	Little Giant...A	26-35	5	.....	Own.	6-5 1/2 x 7	19000	x 12	Wallis.....OK	15-27	3	.....	Own.	4-4 1/2 x 5 1/2	3660	48x12
Best.....30-20	4	.....	.....	Own.	4-4 1/2 x 6 1/2	8000	68x11 1/2	Lombard.....	100	12-10	.....	Own.	6-5 1/2 x 7	19000	x 12	Waterloo Boy..N	12-25	3	.....	Own.	2-6 1/2 x 7	5869	52x12
Best.....60-40	9	.....	.....	Own.	4-6 1/2 x 8 1/2	18580	89x20	London.....	12-25	3	.....	Mid.	4-4 1/2 x 5 1/2	.....	48x12	Wisconsin.....	16-30	3-4	1750	Ch.	4-5 x 6 1/2	5600	52x12
Bryan.....Steam	15-30	3	2385	Own.	2-4 x 5	5500	x 12	McCork-Deering	10-20	2	850	Own.	4-4 1/2 x 5	3700	42x12	Wisconsin.....	22-40	4-5	2550	Ch.	4-5 1/2 x 7	7500	52x12
Case.....12-20	3	895	Own.	1-4 1/2 x 5	4230	42x12	McCork-Deering	15-30	3	1250	Own.	4-4 1/2 x 6	3750	50x12	Yuba (Ball Tread)	15-25	4	2750	Wis.	4-4 1/2 x 6	5750	36x12	
Case.....15-27	15-27	3-4	1350	Own.	1-4 1/2 x 6	6600	52x14	Minneapolis...	12-25	3	.....	Own.	4-4 1/2 x 7	6600	56x12	Yuba (Ball Tread)	25-40	8	4500	Own.	4-5 1/2 x 7	10130	48x17 1/2
Case.....22-40	22-40	4-5	2650	Own.	1-5 1/2 x 6 1/2	10700	56x16	Minneapolis...	17-30	3-4	.....	Own.	4-4 1/2 x 7	6400	54x12								
Case.....40-72	40-72	8-10	4900	Own.	1-7 x 8	21200	72x20	Minneapolis...	22-44	4-5	.....	Own.	4-6 x 7	12410	62x20								
Caterpillar. 2 Ton	15-30	3	.....	Own.	1-4 x 5 1/2	4000	.....	Minneapolis...	35-70	8-10	.....	Own.	4-7 1/2 x 9	22500	85x30								
Caterpillar. 5 Ton	25-40	4	.....	Own.	4-4 1/2 x 6	9400	.....	Moline (Un.)...D	9-18	2-3	725	Own.	4-3 1/2 x 5	3380	52 x 8								
Caterpillar. 10 Ton	40-60	6	.....	Own.	1-6 1/2 x 7	20000	.....	Moline (Orcl.)..D	9-18	2-3	725	Own.	4-3 1/2 x 5	3340	4 x 8								
Cletrac.....F	9-16	2	845	Own.	4-3 1/2 x 4 1/2	1930	42x 5 1/2	Monarch.....E	20-30	4	3800	Bea.	4-4 1/2 x 6	8700	*66x12								
Cletrac.....W	12-20	2	1345	Own.	4-4 x 5 1/2	3455	48x 8	Monarch.....E	25-40	4	5000	Bea.	4-4 1/2 x 6	12000	*67x12								
Eagle.....F	12-22	3	.....	Own.	2-7 x 8	5850	48x12	Monarch.....D	35-60	6	6000	Bea.	6-4 x 6	15000	*89x12								
Eagle.....H	16-30	4	.....	Own.	2-8 x 8	7100	48x12	Nichols-Shepard	20-42	4-6	2600	Own.	2-8x10	13500	64x12								
E-B.....AA	12-20	3	.....	Own.	4-4 1/2 x 5	4550	54x12	Nichols-Shepard	25-50	6-8	3320	Own.	2-9x12	20500	69x28								
E-B.....Q	12-30	3	.....	Own.	4-4 1/2 x 5	6500	60x12	Nichols-Shepard	35-70	8-12	4030	Own.	2-10x14	30000	73x32								
E-B.....16-32	4	.....	.....	Own.	4-5 1/2 x 7	9400	72x16	Pioneer.....G	18-36	4	.....	Own.	4-5 1/2 x 6	6500	60x18								
Fageol.....19-12	2	1200	Lyc.	4-3 1/2 x 5	3600	48x 8 1/2	Pioneer.....C	40-75	10	.....	Own.	4-7 x 8	24000	96x24									
Fordson.....-18	2	420	Own.	4-4 x 5	2562	42x 12	Rumely OilPull.K	12-20	3	.....	Own.	2-6 x 8	6638	51x12									
Frick.....A	12-20	2	1000	Erd.	4-4 x 6	5800	60x10	Rumely OilPull.H	16-30	4	.....	Own.	2-7 x 8 1/2	9506	56x16								
Frick.....C	15-28	3	1600	Bea.	4-4 1/2 x 6	6730	60x12	Rumely OilPull.G	20-40	6	.....	Own.	2-8 x 10	12968	64x20								

GARDEN TRACTORS																																																																																																					
Ave.....F	3-6	1	\$385	Own.	1-4 1/2 x 5	1000	30x 4	Beeman.....Jr.	1 1/2-1	195	B&S.	1-2 1/2 x 3 1/2	210	30x 3	Beeman.....K	1 1/2-4	265	Own.	1-3 1/2 x 4 1/2	550	25x 3 1/2	Bolens.....	1	180	B&S.	1-2 1/2 x 2 1/2	200	16x 3	Centaur.....1923	2 1/2-5 1/2	1	345	N-W.	1-4 1/2 x 4 1/2	800	28x 4	Do-It-All.....(Jack)	2 1/2-6	1	395	Own.	1-3 1/2 x 3 1/2	750	Do-It-All.....(Baby)	2 1/2-6	1	495	Own.	1-4 1/2 x 5	1200	26x 2 1/2	Do-It-All (Twin)	12-14	4-15	1	495	Own.	2-3 1/2 x 3 1/2	800	32x 4	Kinkade.....	1 1/2-3 1/2	1	190	Own.	1-3 x 3	140	22x 5 1/2	M.B.M. Red.....E	1 1/2-3 1/2	1	250	Own.	1-3 1/2 x 4	180	20x 4	Motor Maculivator	N.B.....	2	1	375	Own.	2-2 1/2 x 7	750	32x 4	Utilitor.....501	2 1/2-4	1	295	Own.	1-3 1/2 x 4 1/2	750	24 1/2 x 3 1/2	Utilitor.....501A	2 1/2-4	1	340	Own.	1-3 1/2 x 4 1/2	925	24 1/2 x 3 1/2

B&S —Briggs & Stratton	CH —Climax	Lyc —Lycoming	Ste —Stearns	Wis —Wisconsin	* —Track Type, length of ground contact surface
Ben —Beaver	Her —Hercules	Mid —Midwest	Wau —Waukesha	†—Unless otherwise specified all traction members are of the wheel type.	† —Drum Type
Bud —Buda	LeR —LeRoi	N-W —New Way	Wei —Weideler		

NAME AND MODEL	Price	Wheel Base (Ins.)	Tire Size (Ins.)	Weight (Lbs.)	ENGINE				ELECTRICAL SYSTEM		Clutch Type and Make	Gearset Make	Univer- sal Make	REAR AXLE	
					Make and Model	No. of Cyls., Bore and Stroke	Horse Power Rating (N.A. A.C.)	Carbu- rator Make	Generator and Starter Make	Ignition Make				Type and Make	Gear Ratio
Checker.....	\$2340	117	32x4 $\frac{1}{2}$	4100	Buda—WTU...	4-3 $\frac{3}{4}$ x5 $\frac{1}{2}$	22.50	Zenith...	Westing...	Bosch.....	m-d Fuller....	Fuller.....	Blood.....	$\frac{3}{4}$ F-Columbia.	4.87
Driggs.....	1950	108 $\frac{1}{2}$	30x3 $\frac{1}{2}$	2200	Own.....	4-2 $\frac{1}{2}$ x4 $\frac{1}{2}$	11.03	Zenith.....	Bosch.....	Bosch.....	m-d Fuller....	Fuller.....	Spicer.....	$\frac{3}{4}$ F-Own.....	4.75
Elcar.....	4 2100	118	33x4 $\frac{1}{2}$	3415	Lycoming—CF...	4-3 $\frac{3}{4}$ x5	21.03	Carter.....	Delco.....	Delco.....	s-p Borg & B.	Muncie.....	Peters.....	$\frac{3}{4}$ F-Salisbury.	4.75
Elcar.....	6 2450	118	33x4 $\frac{1}{2}$	3590	Cont—8R.....	6-3 $\frac{3}{4}$ x4 $\frac{1}{2}$	27.34	Strom.....	Delco.....	Delco.....	s-p Borg & B.	Warner.....	Spicer.....	$\frac{3}{4}$ F-Salisbury.	4.75
Pennant.....	2895*	115	33x4 $\frac{1}{2}$	3800	Buda—WTU.....	4-3 $\frac{3}{4}$ x5 $\frac{1}{2}$	22.50	Zenith.....	Westing...	Bosch.....	m-d Fuller....	Fuller.....	Blood.....	$\frac{3}{4}$ F-Columbia.	4.87
Premier.....	4A 2910	118	33x4 $\frac{1}{2}$	3850	Buda—WTU.....	4-3 $\frac{3}{4}$ x5 $\frac{1}{2}$	22.50	Zenith.....	Bosch.....	Bosch.....	m-d Fuller....	Fuller.....	Blood.....	$\frac{3}{4}$ F-Columbia.	4.70
Ranch & Lang.	T 2350	112	32x4	3200	Buda—WTU.....	4-3 $\frac{3}{4}$ x5 $\frac{1}{2}$	22.50	Zenith.....	Dyneto.....	Bosch.....	s-p Detroit...	Detroit.....	Spicer.....	$\frac{1}{2}$ F-Standard.	5.10
*Ranch & Lang.		102	33x4 $\frac{1}{2}$	4100	Own.....	Electric.		None.....	None.....	None.....	None.....	None.....	Own.....	Own.....	8.6
Reo.....	V 2085	113	33x4 $\frac{1}{2}$	3165	Own.....	4-4 $\frac{1}{2}$ x4 $\frac{1}{2}$	27.23	Johnson.	North.E.	North.E.	m-d Own.....	Own.....	Own.....	$\frac{3}{4}$ F-Own.....	4.70
Yellow.....	03 2340	109	33x4 $\frac{1}{2}$	3830	Cont—V4.....	4-3 $\frac{3}{4}$ x5	22.50	Zenith.....	North.E.	Bosch.....	m-d Brown-L.	Brown-L.	Spicer.....	$\frac{1}{2}$ F-Timken.	4.90
Yellow.....	A2 1995	109	29x4 $\frac{1}{2}$	3335	Cont—V7.....	4-3 $\frac{3}{4}$ x5	18.23	Zenith.....	North.E.	Bosch.....	m-d Brown-L.	Brown-L.	Spicer.....	$\frac{1}{2}$ F-Timken.	4.90

Borg & B—Borg & Beck
Brown-L—Brown-Lipe

The chassis are identical to those shown in the Passenger

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES							WHEEL BASE (Ins.)		NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM		Clutch Type and Make	Gearset Make	Universal Type and Make	REAR AXLE		BRAKES, Service and Emergency		
OPEN MODELS			CLOSED MODELS			2-3 Pass.	4-5 Pass.	6-7 Pass.		Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make				Ignition Make	Type and Make		Type and Make	Type and Make
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.				6-7 Pass.						Tire Size (Ins.)							
\$1950e	\$1785	\$1850	\$1885e	\$2250	\$2485		127	33x4 1/2	American.....D-66	H-S..11000	6-3 1/2x5	29.40	Strom.	G-D..	A-K..	s-p	B&B.	B & B	m Hart.	F Salis	4.50	R-R
	1195		1445e	1425	1495		115	32x4	*1Anderson.....41	Cont..7 U	6-3 1/2x4 1/4	23.44	Zenith.	West.	West.	s-p	B&B.	Durston.	f Univ.	1/2 F Salis	4.75	R-R
		1505			1695		122	32x4 1/2	*1Anderson.....50	Cont..8 R	6-3 3/8x4 1/2	27.34	Zenith.	Remy.	Remy.	s-p	B&B.	Durston.	f Univ.	3/4 F Salis	1.50	R-R
	1535				2200		120	32x4	Apperson.....6	Falls.....	6-3 1/8x4 1/4	23.44	Strom.	Remy.	Remy.	s-p	Rock.	Mech.	m Thie.	1/2 F Col.	5.10	R-R
	2800	2800			3750	\$8750	130	33x5	Apperson.....8-23-S	Own.....	8-3 1/4x5	33.80	Johnson.	Bijur.	Remy.	m-d	Own.	Own.	m Thie.	1/2 F Own	4.25	R-R
	1095			1325d	1195d		114	31x4	Auburn.....6-43	Cont..7 U	6-3 1/2x4 1/4	23.44	Strom.	Remy.	Remy.	s-p	B&B.	Warner	m Univ.	1/2 F Col.	4.63	R-R
	1595			1850d	2145	2345	124	32x4 1/2	Auburn.....6-63	Own.....	6-3 1/4x5	25.35	Strom.	Remy.	Remy.	s-p	B&B.	Warner	m Thie.	1/2 F Col.	4.63	R-R
	1395			1495d	1685d	1850	118	32x4	Barley.....6-50	Cont..7 U	6-3 1/2x4 1/4	23.44	Strom.	Delco.	Delco.	s-p	B&B.	Futler.	f M&E.	3/4 F Col.	5.10	R-R
	935	965		800g	1395e	1495	109	31x4	Buick.....1924	Own.....	4-3 3/8x4 3/4	18.23	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	3/4 F Own	4.66	R-R
	1275	1295		1135g	1995e	1695	120	32x4	Buick.....1924	Own.....	6-3 3/8x4 3/4	27.34	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	F Own	1.10	R-R
	1385g			1675a	2235f	2285	128	32x4 1/2	Buick.....1924	Own.....	6-3 3/8x4 3/4	27.34	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	F Own	4.70	R-R
	2985	2985	2985		3875	3950	132	33x5	Cadillac.....V 63	Own.....	8-3 1/2x5 1/2	31.25	Own.	Delco.	Delco.	m-d	Own.	Own.	m Spicer	F Tim	Opt.	F-R
	1750	1790		2230d	2480e	2575	122	32x4 1/2	Case.....X	Cont..8 R	6-3 3/8x4 1/2	27.34	Schebler.	Delco.	Delco.	m-d	Own.	Own.	f Sneed.	1/2 F Col.	4.90	R-R
		1185		2475	1335d	1535	132	33x5	Case.....Y	Cont..6 T	6-3 3/8x5 1/4	31.54	Rayfield.	Delco.	Delco.	m-d	Own.	Own.	f Sneed.	3/4 F Col.	4.70	R-R
		1295				2095	122	32x4	*1Chalmers.....1923	Own.....	6-3 1/4x4 1/4	25.35	Strom.	A-L..	A-L..	m-d	Own.	Own.	m Mech.	1/2 F Tim	5.13	R-R
	1595	1485	1635	1785e		1785	123	32x4	*1Chalmers.....1923	Own.....	6-3 1/4x4 1/2	25.35	Strom.	A-L..	A-L..	m-d	Own.	Own.	m Mech.	1/2 F Tim	5.13	R-R
		1685			2270	2995g			Chandler.....Six	Own.....	6-3 1/2x5	29.40	Strom.	Bosch.	Bosch.	s-p	B&B.	Own.	m Own.	F Own	4.45	R-R
	490	495	395g		640	795	103	30x3 1/2	Chevrolet...Superior	Own.....	4-3 1/4x4	21.76	Zenith.	Holley.	Remy.	e	Own.	Own.	m Own.	1/2 F Own	3.77	R-R
	1085	1045		1145d	1245	1365	112 1/2	31x4	Cleveland.....42	Own.....	6-3 1/2x4 1/2	22.50	Strom.	Bosch.	Bosch.	s-p	B&B.	Own.	m Mech.	1/2 F Own	4.90	R-R
	2175	2175	2175	1295d	1345	1545	127 1/2	33x5 1/2	Cole.....Master	Nort.M311	8-3 1/2x4 1/2	39.20	Johnson.	Delco.	Delco.	m-d	Nort.	Nort.	m Spicer	F Col.	4.70	R-R
		1475		2475	2750e	3075	127 1/2	31x7 1/2														
	995	995		1195d	1395	1995	115	32x4	Columbia.....Big Six	Cont..8 R	6-3 3/4x4 1/2	27.34	Strom.	A-L..	A-K..	s-p	B&B.	Durston.	m Spicer	1/2 F Tim	4.75	R-R
		995			1395	1995	115	31x4	Columbia.....Light Six	Cont..6 Y	6-3 3/4x4 1/2	23.44	Strom.	A-L..	A-L..	s-p	B&B.	Durston.	m Spicer	1/2 F Tim	5.10	R-R
	1395p	1295		1595e	1495	2195p	116	32x4	Courier.....	Falls. 8000	6-3 1/2x4 1/2	23.44	Strom.	West.	A-K..	s-p	B&B.	Muncie.	f Flex.	3/4 F Col.	5.10	R-R
		3100	3100			4500	138	33x4 1/2	Crawford.....23-6-70	Cont..6 T	6-3 3/8x5 1/4	31.54	Zenith.	West.	Bosch.	m-d	B-L..	B-L..	m Spicer	1/2 F Tim		R-R
		5800	6300		3500e	4500	138	33x5	Crawf rd-Dagmar.6-70	Cont..6 T	6-3 3/8x5 1/4	31.54	Zenith.	West.	Bosch.	m-d	B-L..	B-L..	m Spicer	1/2 F Tim		R-R
	5000	4650	4700	4650e		6350	132	33x5	Cunningham.....V4	Own.....	8-3 1/2x5	45.00	Strom.	Delco.	Delco.	m-d	Own.	Own.	f Sneed.	F Tim	4.23	R-R
		5000	5150		6000e	6600	138	33x5	Daniels.....23-38	Own.....	8-3 1/2x5 1/4	39.20	Zenith.	Delco.	Delco.	m-d	Own.	Own.	m Spicer	F Tim	4.23	R-R
	1295	1495		1495e		1595	115	31x4	Daniels.....23-38	Own.....	8-3 1/2x5 1/4	39.20	Zenith.	Delco.	Delco.	m-d	Own.	Own.	m Spicer	F Tim	4.23	R-R
	850	880		730g	1035	1250	116	32x4	Davis.....71	Cont..7 U	6-3 1/2x4 1/4	23.41	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m Peters	1/2 F Tim	5.10	R-R
		3950	3950	4150e	4985e	5550	136	32x6	Dodge Brothers.	Own.....	4-3 3/4x4 1/2	24.03	Stewart.	N.E..	N.E..	m-d	Own.	Own.	m Own.	1/2 F Own	4.54	R-R
		1095		1245e	1535d	1595	115	31x4														
	6500	6250	6750	6500e	4780d	7500	134	33x5	Dorris.....6-80	Own.....	6-4 x5	38.40	Strom.	West.	Bosch.	m-d	Own.	B-L..	m Spicer	1/2 F Tim	3.77	R-R
	890	890		1065d	1365	1465	109	31x4	Dort.....27	Falls T8000	6-3 1/2x4 1/2	23.44	Carter.	Bosch.	Bosch.	m-d	Det.	Own.	m Ther.	3/4 F Fin.	4.60	R-R
					1365	1465	109	31x4	Duesenberg.Straight 8	Own.....	8-2 1/2x5	26.45	Strom.	Delco.	Delco.	s-p	Own.	Own.	f Cli.	1/2 F Own	4.45	R-R
					1465				Durant.....A-22	Cont.Spec	4-3 3/4x4 1/2	24.03	Tillotson	A-L..	A-L..	s-p	Own.	Warner.	m Spicer	1/2 F Ad.	4.33	R-R
	1485	1095		1275d	1395e	1595	112	32x4	Earl.....40	Own.....	4-3 1/2x5 1/4	18.91	Scoc.	A-L..	Conn.	s-p	B&B.	Own.	f Own.	1/2 F Own	4.87	R-R
		995		1195d		1265f	112	31x4	Eclair.....4-40	Lyc.....K	4-3 3/8x5	21.03	Strom.	Delco.	Delco.	s-p	B&B.	Warner	m Peters	1/2 F Salis	4.50	R-R
		1395		1595d	1195d	1995	118	32x4	Eclair.....6-60	Cont..8 R	6-3 3/4x4 1/2	27.34	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m Spicer	1/2 F Salis	4.40	R-R
		1895			2145	2345	118	32x4 1/2	Elgin.....	Falls-Spec.	6-3 1/2x4 1/2	23.44	Strom.	DeJon.	DeJon.	s-p	B&B.	Warner.	f-	3/4 F Col.	4.33	F-T
		850			975		110 1/2	31x3 3/4	Esox.....	Own.....	6-2 3/8x4	16.54	Own.	Bosch.	Bosch.	m-d	Own.	Own.	m Spicer	1/2 F Own	5.40	R-R
	1295	1295		1295	1895e	2085	120	32x4	Flint.....	Cont.Spec	6-3 3/8x5	27.34	Strom.	DeJon.	DeJon.	s-p	Own.	Warner.	m Spicer	1/2 F Ad.		R-R
	265r	295g	230g		525	685	100	30x3 1/2	Ford.....T	Own.....	4-3 3/4x4	22.50	Own.	Own.	Own.	m-d	Own.	Own.	m Own.	1/2 F Tim	3.63	T-R
	2975	2975			3975	3975	132	32x4 1/2	Fox.....Air-Cooled	Own.....	6-3 3/8x5	27.34	Zenith.	West.	Scintilla	m-d	B-L..	B-L..	m Spicer	1/2 F Tim	4.90	R-R
		1950			2750e	2250	115	32x4 1/2	Franklin.....10-B	Own.....	6-3 1/4x4	25.35	Own.	A-K..	A-K..	s-p	M&E.	Own.	m Spicer	1/2 F Own	4.73	T-R
		895	895	995d	1095	1145	145	32x4	Gardner.....Series 5	Lyc...Spec	4-3 1/4x5	21.76	Zenith.	West.	West.	s-p	B&B.	Mech.	m Peters	3/4 F Fin.	4.40	R-R
	510	520		625d	685	835	100	30x3 1/2	Gray.....	Own.....	4-3 3/8x4	21.03	Scoc.	West.	West.	s-p	Own.	Own.	m Mech.	1/2 F Tim	3.90	R-R
	2250	2250				3350	120	32x4 1/2	H.C.S.....Series 4	Weid.....	4-3 3/4x5 1/2	22.50	Strom.	Delco.	Delco.	m-d	B-L..	B-L..	m Spicer	3/4 F Own	4.63	R-R
		2650				3350	126	32x4 1/2	H.C.S.....Series 6	Own.....	6-3 3/8x5	29.40	Strom.	Delco.	Delco.	m-d	B-L..	B-L..	m Spicer	3/4 F Own	4.36	R-R
	1395	1395		1495e		2195	121	32x4	Hanson.....66	Cont..8 R	6-3 3/4x4 1/2	27.31	Marvel.	Delco.	Delco.	s-p	B&B.	G-L..	m Univ.	F Tim	4.66	R-R
		1345	1345e		1950	1950	115	32 x 4	Hatfield.....A-42	H-S..7000	4-3 1/2x5	19.60	Zenith.	Dyneto	Comm.	s-p	B&B.	G-L..	m Spicer	3/4 F Col.	4.66	R-R
		1775			2175e	2350	121	32x4	Hatfield.....6-55	H-S..40	4-3 1/2x5	25.35	Strom.	Bosch.	Bosch.	s-p	B&B.	Durston.	m Spicer	1/2 F Col.	4.63	R-R
	1995			1995	2150	2095	132	33x5	Haynes.....77	Own.....	6-3 3/8x5 1/4	31.54	Strom.	L-N..	Kingst.	m-d	War.	Own.	m Univ.	3/4 F Own	4.60	R-R
				1685b	2195	1845	121	32x4 1/2	Haynes.....60	Own.....	6-3 1/2x4 3/4	29.40	Rayfield.	L-N..	Kingst.	m-d	War.	Mech.	m Ther.	1/2 F Own	4.41	R-R
		1395		1750d		1895	126	31x4 1/2	Hudson.....Super 6	Own.....	6-3 1/2x5	29.40	Own.	Bosch.	Bosch.	m-d	Own.	Own.	m Spicer	1/2 F Own	4.45	R-R
	1175	1175		1195a	1445	1750	115	32x4	Hupmobile...Series R	Own.....	4-3 1/2x5 1/2	16.90	Strom.	West.	A-K..	m-d	Long.	Own.	m Univ.	3/4 F Own	4.87	R-R
				1195d		1595																
	1195	1065	960g	1220d	1325d	1495	112	31x4	Jewett.....Six	Own.....	6-3 1/2x5	25.36	Strom.	Remy.	A-K..	m-d	Long.	Warner.	m Mecn.	1/2 F Tim	4.45	R-R
					1695p																	
	1750	1675			2285e	2285f	120	32x4	Jordan.....MX	Cont.Spec	6-3 1/2x4 3/4	26.34	Strom.	Delco.	Delco.	s-p	Detr.	Detroit.	m Thie.	1/2 F Tim	4.42	R-R
		1995			2585	2785	124 1/2	32x4 1/2	Jordan.....H&L	Cont.Spec	6-3 1/2x4 3/4	26.34	Strom.	Delco.	Delco.	s-p	Detr.	Detroit.	m Thie.	1/2 F Tim	4.42	R-R
					1450		112	32x4	Kelsey.....G	Lyc.....CF	4-3 3/8x5	21.03	Zenith.	Bosch.	Bosch.	s-p	B&B.	W-M..	m Spicer	1/2 F Salis	4.70	R-R
	1595	1595	1595e	1895e	2200e	1995	120	32x4 1/2	King.....LL	Own.....	8-3 x5	28.80	Ball&B	West.	A-K..	s-p	Detr.	Own.	f Univ.	F Col.	4.88	R-R
	1795	1795	1795e	1995e	2500	2295	124	32x4 1/2	King.....L	Own.....	8-3 x5	28.80	Ball&B	West.	A-K..	s-p	Detr.	Own.	f Univ.	F Col.	4.46	R-R
	2085	1585		1985e	2485e	2585f	121	32x4	Kissel.....55	Own.....	6-3 3/8x5 1/2	26.34	Strom.	Remy.	Remy.	s-p	B&B.	Warner.	m Spicer	3/4 F Tim	4.61	R-R

*Four Wheel Brakes optional at extra cost on all models.

*1—\$ 75	*3—\$125
*2—\$100	*4—\$150

*2— 350	*4— 150
a—2 Passenger	e—6 Passenger

[illegible]

c—4 Passenger g—Chassis Price
d—5 Passenger p—Sport Model

†—On Standard Phaeton Models

§—Brougham §—Limousine
 r—Price without starter and demour

able rims. Price, complete, For \$250.

s—Price without starter and demour

able rims. Price, complete, For \$280.

4—Optional equipment at extra cost

(Continued on Page 7)

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

A-L—Auto-Lite
Ad—Adams
Anst—Ansted
B & B—Borg & Beck
B-L—Brown-Lipe
Ball & B—Ball & Ball
Cl—Climax
Col—Columbia
Cont—Continental
Detl—Detlaf
Detr—Detroit
Dool—Dooley
Dues—Duesenberg
Eat—Eaton
Eisem—Eisemann

Flex—Flexite
Flin—Flint
G-D—Gray & Davis
G-L—Grant-Lees
H-S—Herschell-Spillman
Hart—Hartford
Hoos—Hoosier
Kingst—Kingston
Kn't—Knight Type
L-N—Leec-Neville
Lye—Lycoming
M & E—Merchant & Evans
Mech—Mechanics
N. E.—North East
North—Northway

Rock—Rockford
Salis—Salisbury
Spec—Special
Split—Splitdorf
Sid—Standard
Strom—Stromberg
Thie—Thiener
Ther—Thermoid
Till—Tillotson
Tim—Timken
Univ—Universal
W-M—Willys-Morrow
Wag-R—Wagner or Remy
Walk—Walker
War—Warner
Weid—Weidely

West—Westinghouse
Y. & T.—Yale & Towne
F—Floating
½ F—Semi-Floating
¾ F—Three Quarter Floating
c—Cone
f—Fabric
m—Metal
s-p—Single Plate
m-d—Multiple Disc
F—Four Wheels
R—Rear Wheels
T—Transmission
1—Contracting
2—Expanding



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CADILLAC



Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES						Wheel Base (In.)	Tire Size (In.)	NAME AND MODEL	ENGINE				ELECTRICAL SYSTEM		Clutch, Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE		BRAKES, Service and Emergency
OPEN MODELS			CLOSED MODELS						Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make				Type and Make	Gear Ratio	
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.														
5000	5000	5000	4200c	6300	6500	132	33x5	LaFayette	Own.	8-3 1/4x5 1/4	33.80	Johnson	Delco	Delco	m-d Own.	Own.	m Own.	F Own	4.58	R-L
1795	1795	1795	2145d	2345	2345	123	32x4 1/2	Lexington	Anst.	6-3 1/4x4 1/2	26.30	Rayfield	Delco	Delco	s-p Long.	Warner.	f Sued.	1/2 F Sals	5.10	R-L
3800	3800	3800	4600c	4400	4900	130	33x5	Lincoln	Own.	8-3 1/2x5	36.45	Strom.	Delco	Delco	m-d Own.	Own.	m Spicer	F Tim	4.58	R-L
8090	7900	7900	11750	11600	12200	142	35x5	*2Locomobile Series 8	Own.	6-4 1/2x5 1/2	48.60	Ball&B.	West.	Delco	m-d Own.	Own.	m Own.	F Own	3.85	R-L
2300g	2785	2785	2985a	3585	4285	136	32x4 1/2	*3Marmon	Own.	6-3 1/2x5 1/2	33.75	Strom.	Delco	Delco	m-d Own.	Own.	m Spicer	3/4 F Own	4.10	R-L
795	795	795	895b	1195	1585d	109	31x4	Maxwell	Own.	4-3 1/2x4 1/2	21.03	Stewart	Remy	Remy	s-p Mech.	Own.	f Own.	1/2 F Own	4.60	R-L
2500	2500	2500	3000	3000	3000	127	32x4 1/2	McFarlan	Own.	6-3 1/2x5	27.34	Rayfield	Delco	Delco	m-d	Own.	m Peters	1/2 F Tim	3.75	R-L
5400	5600	5700	6720	6690	6810	140	33x5	*4McFarlan	Own.	6-4 1/2x6	48.60	Rayfield	West.	West.	m-d M&E	B-L	m Peters	F Tim	3.75	R-L
3950b	3950c	3950c	4700	4850	5250	132	32x4 1/2	Mercer	Own.	4-3 1/2x6 1/2	22.50	Ball&B.	West.	Eisem.	m-d Own.	Own.	m Spicer	F Own	3.87	T-R
1295	3750c	3750c	4700	4850	5250	132	32x4 1/2	Mercer	Own.	6-3 1/2x5	33.75	Strom.	West.	Eisem.	m-d Own.	Own.	m Spicer	3/4 F Own	3.77	R-L
1295	1295	1295	1495d	1685c	1695	115	31x4	Mocon	Cont.	7 U	23.41	Strom.	Delco	Delco	s-p B&B.	Warner.	m Spicer	1/2 F Tim	5.10	R-L
	1785	2150	2585	2485	2485	128	32x4 1/2	Moon	Cont.	8 R	27.31	Strom.	Delco	Delco	s-p B&B.	B-L	m Spicer	1/2 F Tim	5.09	R-L
1240	1240	1050g	1615c	2090c	2090	121	33x4	Nash	Own.	6-3 1/4x5	25.35	Marvel.	Delco	Delco	s-p B&B.	Own.	m Own.	1/2 F Own	4.50	R-L
915	935	1390	1195d	1890	2190	127	34x4 1/2	Nash	Own.	6-3 1/4x5	25.35	Marvel.	Delco	Delco	s-p B&B.	Own.	m Own.	1/2 F Own	4.90	R-L
2175	2475c	2375	2485d	3250	3285	130	32x4 1/2	Nash	Own.	4-3 1/2x5	18.23	Marvel.	Delco	Delco	s-p B&B.	Own.	m Own.	1/2 F Own	4.88	R-L
2500	2500c	2000c	3725	3500	3500	128	33x5	National	Own.	6-3 1/2x5 1/4	29.40	Rayfield	West.	Delco	s-p B&B.	B-L	m Univ.	F Col.	4.08	R-L
945	945	1095a	1195	1345	1395	113	31x4	Noma	Cont.	8 R	27.34	Zenith.	Delco	Delco	s-p B&B.	Detroit.	m Spicer	1/2 F Tim	4.45	R-L
750	750	1095d	955	1035	1095	110	31x4	Oakland	Own.	6-2 1/2x4 1/2	18.90	Strom.	Remy	Remy	s-p Hoos.	Muncie.	m Mech.	1/2 F Own	4.70	F-L
495	495	305g	750	795	695d	100	30x3 1/2	Oldsmobile	Own.	6-2 1/2x4 1/2	18.15	Zenith.	Delco	Delco	s-p B&B.	Muncie.	f Own.	1/2 F Own	5.10	R-L
185	2485	2250g	3175c	3275	3350d	126	33x4 1/2	Overland	Own.	4-3 1/2x4	19.60	Tillotson	A-L	A-L	s-p B&B.	Own.	m Own.	1/2 F Own	4.50	R-L
3450c	3650	3850	4550c	4735	4700g	136	33x5	Overland	Own.	4-3 1/2x4	19.60	Tillotson	A-L	A-L	s-p B&B.	Own.	m Own.	1/2 F Own	4.50	R-L
245j	245j	3850	4550c	4735	4700g	136	33x5	Packard	Own.	6-3 1/2x5	27.34	Own.	A-K	Delco	m-d Own.	Own.	m Spicer	1/2 F Own	4.66	R-L
1550	1390	1425	2295d	3275	3350d	126	33x4 1/2	Packard	Own.	6-3 1/2x5	27.34	Own.	A-K	Delco	m-d Own.	Own.	m Spicer	1/2 F Own	4.66	R-L
2690	2750	2260g	3300	3525f	3575j	133	33x4 1/2	Packard "Eight"	Own.	8-3 1/2x5	36.45	Own.	Dyneto.	Delco	m-d Own.	Own.	m Spicer	1/2 F Own	4.70	F-L
5250	5250	5250	6800	4900f	4950j	143	33x5	Packard "Eight"	Own.	8-3 1/2x5	36.45	Own.	Dyneto.	Delco	m-d Own.	Own.	m Spicer	1/2 F Own	4.70	F-L
1095	1715	1745	2415	3235	3435j	120	32x4 1/2	Packard "Eight"	Own.	8-3 1/2x5	36.45	Own.	Dyneto.	Delco	m-d Own.	Own.	m Spicer	1/2 F Own	4.70	F-L
2535	2535	2585d	3385	3235	3435j	120	32x4 1/2	Paterson	Cont.	8 R	27.34	Strom.	Delco	Delco	s-p B&B.	Durston.	m Spicer	1/2 F Sals	4.90	R-L
2300	2350	2400c	3000d	3275	3350d	126	33x4 1/2	Paterson	Own.	8-3 1/2x5	33.80	Ball&B.	Delco	Delco	m-d Own.	Own.	m Spicer	1/2 F Tim	4.90	R-L
1835	1835	1545d	1875	3385	3585	123	32x4 1/2	Pierce-Arrow	Own.	6-4 x5 1/2	38.40	Own.	Delco	Delco	m-d Own.	Own.	m Spicer	1/2 F Own	4.29	R-L
3200c	3200	3200c	4000	3385	3585	123	32x4 1/2	Pilot	I.S.	90	25.35	Tillotson	Wagner	Wagner	s-p Hoos.	Muncie.	m Blood.	3/4 F Col.	4.67	R-L
1645	1595	2035	2135	3585	3585d	117	32x4	Premier	Own.	6-3 1/2x5 1/2	27.34	Strom.	Delco	Delco	s-p B&B.	Own.	m Spicer	1/2 F Tim	4.58	R-L
2685	2485	2685	2750c	3285	3585d	117	32x4	R & V Knight	Own.	6-3 1/2x5	29.40	Strom.	A-L	A-L	s-p B-L.	B-L	m Spicer	1/2 F Tim	5.40	R-L
3685	3485	3800	3650c	4250p	3950	128	32x4 1/2	Reo	Own.	6-3 1/2x5	24.34	Rayfield	N.E.	N.E.	m-d Own.	Own.	m Own.	1/2 F Own	4.70	R-L
3785	895	11450	975	1175	1275	112	31x5 1/4	Revere	Own.	4-4 1/2x6	28.00	Strom.	West.	Bosch	m-d B-L.	B-L	m Spicer	3/4 F Std	3.44	R-L
11400	10900	11450	13500	12850	12900	131	32x4 1/2	Rickenbacker	Own.	4-4 1/2x6	30.63	Strom.	Bosch	Bosch	s-p Own.	Warner.	m Mech.	3/4 F Col.	5.10	F-L
1615	1615	2015d	2615	3585	3585d	117	32x4	Roamer	Own.	6-3 1/2x4 1/2	23.44	Strom.	Bosch	Split	s-p Own.	Warner.	m Mech.	3/4 F Col.	5.10	F-L
875	875	2035	2135	3585	3585d	117	32x4	Roamer	Cont.	12XD	29.40	Strom.	West.	Split	s-p B&B.	G-L	f Sued.	1/2 F Tim	4.60	
985	985	2035	2135	3585	3585d	117	32x4	Roamer	Cont.	12XD	29.40	Strom.	West.	Split	s-p B&B.	G-L	f Sued.	1/2 F Tim	4.60	
2750	2750	2425g	3585	3985	3985	130	32x4 1/2	Rollin	Own.	6-3 1/2x5 1/2	29.40	Strom.	West.	Split	s-p B&B.	G-L	f Sued.	1/2 F Tim	4.60	
490	490	640d	785	1035	1095	112	31x4	Rolls-Royce	Own.	4-3 1/2x4 1/2	16.90	Tillotson	Dyneto.	Conn.	s-p B&B.	Muncie.	f Sued.	1/2 F Sals	5.10	F-L
1750c	1750	1445g	1995p	2350	2195j	125	31x4 1/2	Rolls-Royce	Own.	4-4 1/2x4 1/2	48.60	Own.	Bijur.	Bosch	e Own.	Own.	m Own.	1/2 F Own	3.72	R-L
2395	2395	2195	2195g	3395	3395	130	34x4 1/2	Rubay	Own.	4-2 1/2x5 1/4	12.10	Strom.	Bosch.	Bosch.	s-p Own.	Own.	m Own.	F Own	5.10	F-L
1295	1295	1595	1850c	2250	2250	117	32x4	Sayers Six	Cont.	8 R	27.34	Strom.	Delco	Delco	s-p B&B.	G-L	m Arva.	1/2 F Std.	4.75	R-L
975	985	845g	1195	1485	1395d	112	31x4	Seneca	I.L.	KB	19.60	Zenith.	A-L	A-L	s-p B&B.	G-L	m Univ.	F Peru	4.75	R-L
1325	1350	1100g	1895d	1985	2685	119	32x4	Seneca	I.L.	KB	21.03	Zenith.	A-L	A-L	s-p B&B.	G-L	m Univ.	F Peru	4.50	R-L
1450g	1750	1835d	2495	2685	2685	126	33x4 1/2	Stanley	Own.	2-4 x5	13.00	None.	Bijur.	None.	None.	None.	None.	1/2 F Own	1.50	R-L
1995	1995	2315d	2550	3490	3490	120	32x4	Star	Cont.	Spec	15.63	Tillotson	A-L	A-L	s-p Own.	Warner.	m Spicer	1/2 F Tim	4.87	R-L
2150	2790	2640	3115c	3490	3490	130	32x4 1/2	Stearns-Knight	Own.	4-3 1/2x5 1/2	22.50	Schebler	West.	A-K	m-d Own.	Own.	f Chi.	1/2 F Own	4.50	R-L
1275	1275	1525b	1485d	1895	1945j	118	32x4	Stearns-Knight	Own.	6-3 1/2x5	27.34	Schebler	West.	A-K	m-d Own.	Own.	f Chi.	1/2 F Own	4.70	R-L
1785	1990	2190f	2490f	2490f	2490f	116	32x4	Stephens	Own.	6-3 1/2x4 1/2	25.35	Strom.	Delco	Delco	s-p B&B.	Mech.	m Mech.	1/2 F Tim	5.10	R-L
1890	1590c	2490f	2490f	2490f	2490f	125	32x4 1/2	Stephens	Own.	6-3 1/2x4 1/2	25.35	Strom.	Delco	Delco	s-p B&B.	Mech.	m Mech.	1/2 F Tim	5.30	R-L
2575	2475	3375j	3275	3475	3575	121	32x4 1/2	Sterling-Knight	Own.	6-3 1/2x4 1/2	25.35	Strom.	West.	West.	m-d Fuller.	Fuller.	f Clim.	1/2 F Tim	4.66	R-L
1175	1175	1615c	1550c	1895p	1895p	112	31x4	Studebaker	Own.	6-3 1/2x5	29.40	Strom.	Wag-R	Wag-R	s-p Own.	Own.	f Ther.	1/2 F Own	4.55	R-L
3400	3600	4250c	4450p	4700g	4700g	128	33x4 1/2	Studebaker	Own.	6-3 1/2x5	36.04	Ball&B.	Wag-R	Wag-R	s-p Own.	Own.	m Spicer	1/2 F Own	4.33	R-L
						126	33x4 1/2	Studebaker	Own.	6-3 1/2x5	36.04	Ball&B.	Wag-R	Wag-R	s-p Own.	Own.	m Spicer	1/2 F Own	3.70	R-L



Profit by Selling Genuine Parts!

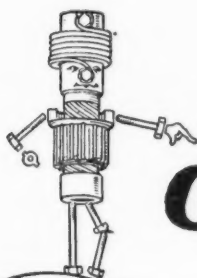
GENUINE replacement springs for the Bendix Drive, like all other genuine parts, are the product of long experience and absolute knowledge of what is best. Superiority is further assured by skilled workmanship, the use of best materials, and careful inspection at every stage of production.

Genuine parts are plainly marked with the name "Bendix" for your protection—and packed in handy, trade-marked cartons for easy identification and stock-keeping. This convenience combines with superiority to make them most profitable for you.

Maintain the confidence of your customers by selling genuine parts. In our experience none but a genuine part will give our standard of satisfactory, dependable service in the Bendix Drive.

The Bendix Drive will be exhibited at the New York Automobile Show Space No. 98, and the Chicago Automobile Show, Space No. 59.

CAUTION: In our Bendix Drive advertisements, now appearing regularly each month in *The Saturday Evening Post* and *The Literary Digest*, the public is being cautioned to buy none but *genuine* parts and is asked to look for the name "Bendix" on each part.



It pays to sell none but
GENUINE PARTS
 FOR
BENDIX
DRIVE

ECLIPSE MACHINE CO., ELMIRA, NEW YORK

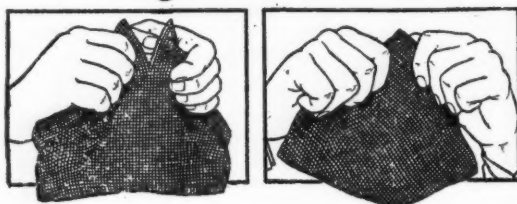
Detroit Office
 1342 Book Bldg.

Eclipse Machine Co., Limited
 Walkerville, Ontario

GATES BELTS

"The Standardized Fan Belt"

Try this test



Take a piece of light fabric that you can tear easily in this manner—that is, straight across. Then try to tear diagonally as in the next picture.

You find that it has double strength on the bias—a good illustration of the value of the bias weave construction.

Ever try to tear a piece of fabric on the bias? Then you know why the patented bias weave construction puts the extra durability into Gates Vulco Belts.

Made by the World's Largest
Manufacturers of Fan Belts



CURTIS AIR COMPRESSORS

OMAHA—16th Street looking north.
Nebraska, population 1,296,372.
269,520 automobiles registered—
nearly one car for every four people.



In Nebraska

HERE again you find Curtis outfits dominate. Sooner or later real merit is always recognized. That's why Curtis is continually supplanting other makes of compressors—why Curtis popularity is constantly growing.

It should mean something to the purchaser of a Curtis Outfit to know that he can have complete faith in it—that the firm manufacturing it is a big, long established institution with ample resources and a successful record of 70 years' manufacturing experience, 27 of which have been devoted to the design and manufacture of air compressors and compressed air equipment.

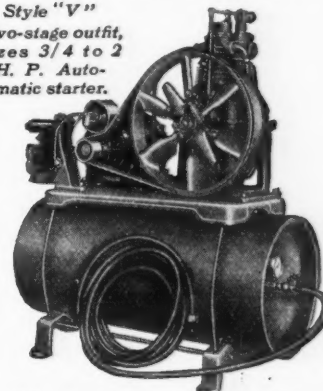
All of this is your assurance that when you buy a Curtis you are getting a tried and proven product—one with an enviable record and a definite reputation to live up to; an assurance that your Curtis is not likely to ever become an "orphan."

CURTIS PNEUMATIC MACHINERY CO.
1527 Kienlen Ave. St. Louis, U. S. A.

Branch Office

530-H Hudson Terminal, New York City

Style "V"
Two-stage outfit,
Sizes 3/4 to 2
H. P. Auto-
matic starter.



No Spitting of Oil When A Curtis Cuts Out

There are two sound reasons for this. First: the exclusive and patented controlled splash oiling system prevents an excess of oil from getting into the discharge line. Second: there is no bleeding discharge pipe or intermediate tank. Automatic starting and stopping device includes a centrifugal unloader, to relieve compressor of starting load.

**Use
This
Coupon**

**CURTIS
PNEUMATIC
MACHINERY CO.**
1527 Kienlen Ave.
ST. LOUIS, MO.

Gentlemen:—Please send me full details on Curtis Air Compressors, your proposition and prices.

Name.....

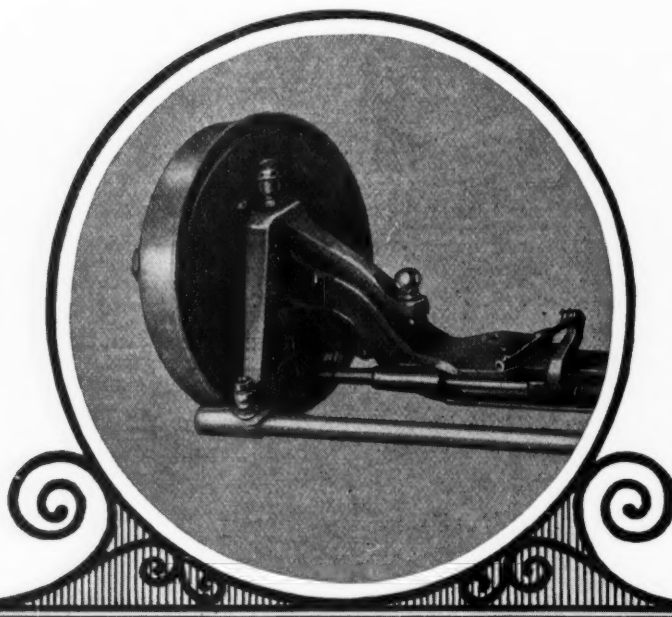
Address.....

Jobber's Name.....

Address.....

CURTIS

1854 ^{70th} ANNIVERSARY 1924



The Greatest Replacement Opportunity the Industry has ever seen

Are You Going to Pass It By?

Any of these
10 Cars

Of any model may be
equipped with Front
Wheel Brake Axles.

BUICK
CADILLAC
CHANDLER
HUDSON
KISSEL
PACKARD
PAIGE
PIERCE-ARROW
STUDEBAKER
WILLS ST. CLAIRE

*Also available for nearly
all other makes of cars.*

A leading authority has estimated that the majority of the cars to be exhibited at the New York Show will be equipped with Front Wheel Brakes. Do you know what this means to YOU?

It means that practically every car owner in your territory after seeing the cars exhibited at the show this year will go home feeling that his old car is out-of-date. He will feel that every up-to-date car is four-wheel-brake equipped.

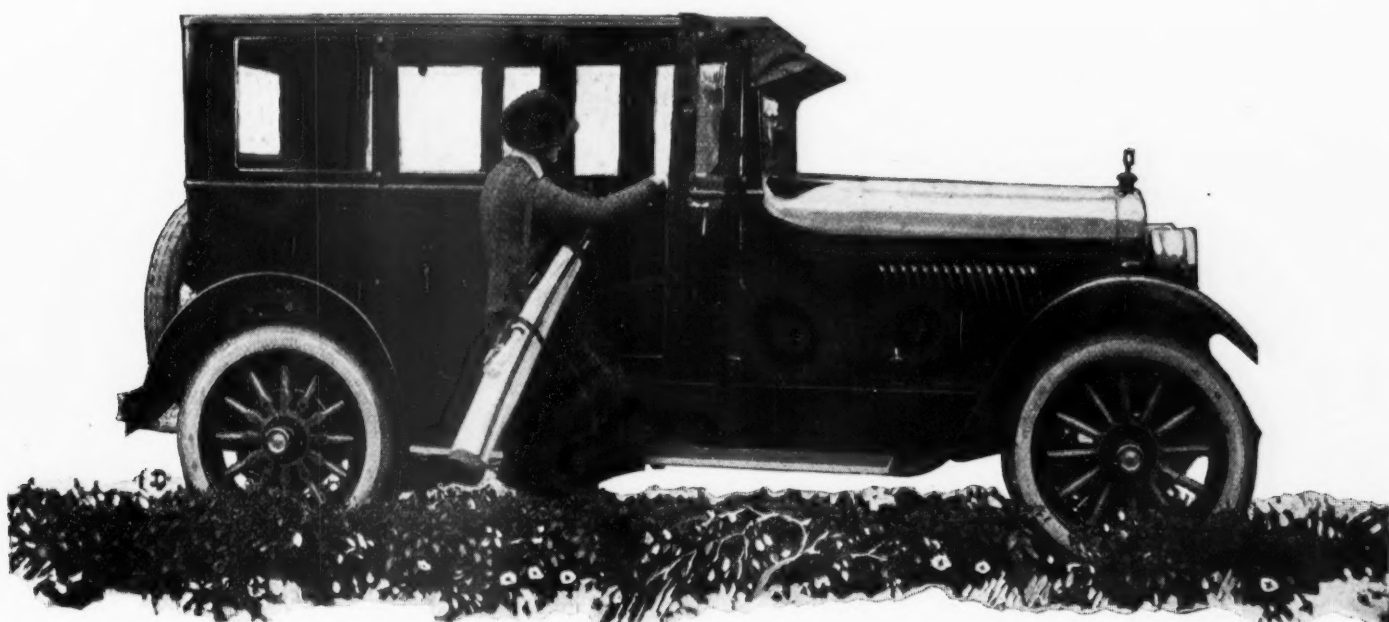
In this condition lies your great opportunity. U. S. Front Wheel Brake Axles are now available for practically all makes of cars, and are interchangeable with the old axles. This means that installation is easy. Safety and thorough efficiency has been proved by three years of performance. Their utmost simplicity will appeal to every motorist.

*Write today for full particulars. Get
in line for this replacement business.*

U. S. AXLE CO., Pottstown, Pa.

Pioneer Builders of Front Wheel Brake Axles





ANNOUNCING ✓

Lexington "Concord Six"

With Famous **\$1395** Ansted Engine



Good territories are open to aggressive dealers of established reputation and financial responsibility.

HERE it is the first great surprise of 1924 the new and incomparable Lexington "Concord Six" with the world-famous Ansted engine, priced at \$1,395.

You will marvel at this car when you see it at the Auto Show. And well may you do so, for, irrespective of price, you can count on the fingers of one hand the cars capable of equalling its performance.

Pike's Peak championship 70-horsepower Ansted engine the greatest six-cylinder motor ever developed special Lexington double-triangular center-braced frame, plus Lexington coachwork at \$1,395!

The new "Concord Six" is every bit a Lexington. In speed, durability, performance and dependability it is the equal of any Lexington previously designed . . . which means that comparable quality is not to be found under \$2,000.

Study every car at the show . . . drive as many as you like and you will recognize this latest and most astonishing Lexington as the outstanding motor-car value of the day.

Current models of the Lexington "Minute Man" with important improvements will be continued in 1924.

LEXINGTON MOTOR CO., CONNERSVILLE, IND., U.S.A

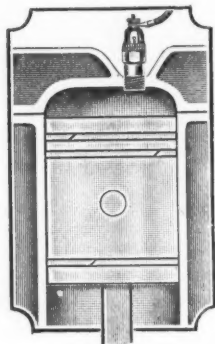
Lexington

MOTOR CARS

"THE BEST EQUIPPED SHOP GETS THE BUSINESS"

"They treat you right!"

The aim of a Stevens "Speed-Up" Tool is not alone to do a job faster, but also to do it a whole lot better—to get folks to keep on saying, "They treat you right!"—and to treat yourself right on the profits.

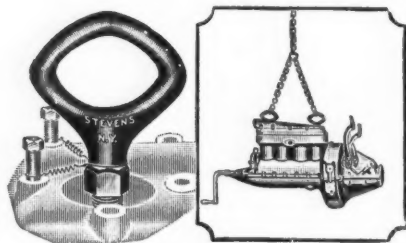
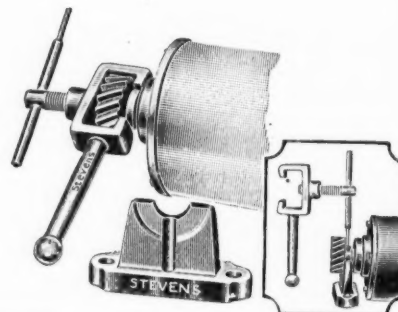


To Time Spark, Watch the Ball

One man can now do it all—crank the engine, test the firing order, time the spark—*by just watching the ball*. The plunger on STEVENS TIMING TESTER rides on air displaced by piston. When piston is on compression stroke, the plunger ball bobs up—at exact top dead center, the ball remains still—on explosion stroke, the ball drops abruptly. So the ball tells top dead center when cylinder should fire. The upper part of Tester, when hooked up, sparks like a spark plug, while the plunger ball gives position of piston to enable you to time spark accurately. T-93, Set of 3 sizes—S. A. E., 1/2-in., Metric—\$4. Single size, \$1.50.

See How Complete

It's typical of Stevens "Speed-Up" Tools that they are designed with just those extra details that do a job *completely*. Here in this Generator Gear Puller for Ford, a punch is cleverly machined into the handle; there's a convenient holder for the puller, and a grooved block to receive the pin and take the strain off the bearings. It's this "Speed-Up" completeness which makes the Puller the quicker, safer method of replacing the gear. T-180—Price \$2.00.



Here's the Quickest Way

And here is one of the many obvious time-savers in the "Speed-Up" line—STEVENS ENGINE HANDLES which screw into the spark plug holes and lift either the whole engine or the head alone, with safety and speed. Drop-forged, of course. T-241—S. A. E. size, \$2.00 per pair. T-240—Ford, \$2.00 per pair.

"Speed-Up" Catalog A is loaded with extra profits for you—Write for it today.

STEVENS & COMPANY

375 Broadway

New York

"Thru your jobber—his service is economy"

100 SPECIAL TOOLS

EACH FITS A JOB

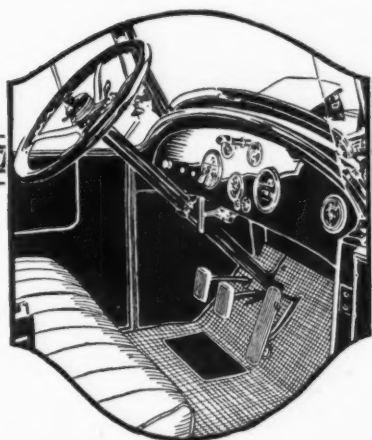
Stevens

**SPEED
UP**
TRADE MARK



Tools

Mechanical
Gear-Shift



No Levers

APPERSON

as old as the industry

APPERSON—the proud, old aristocratic name of the first practical automobile built in America, goes into its thirty-first year, proud of its engineering accomplishments and SURE OF ITS FUTURE.

Backed by thirty years of intensive and sincere engineering at the hands of Edgar Apperson, the APPERSON Six is the finest engineered car in America.

New York
Show
Space 2

This name, this engineer and this car are associated with men who have made conspicuous successes in the executive end of the automobile industry. Behind them are resources which make the success of APPERSON in 1924 a certainty.

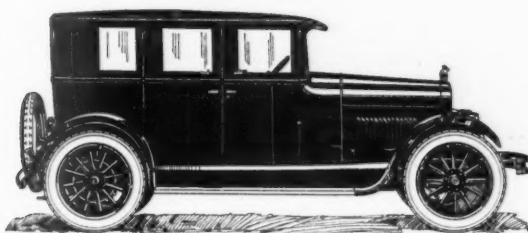
Chicago
Show
Space
A 27-28

Those dealers who appreciate the trend of public demand toward a finely engineered, light weight, medium priced six that is capable of giving all the much larger, more expensive cars can give, will do well to get in touch with APPERSON now.

Let us furnish you with our Dealer Booklet—*The Car, The Factory and the Policy.* Write factory today.

Sixes

\$1535 to \$2200



Eights

\$2385 to \$3750

THE APPERSON SIX SEDAN

Mechanical Gear-Shift Standard Equipment on all Models

APPERSON BROS. AUTOMOBILE CO., KOKOMO, INDIANA

It Pays to Buy a Kellogg

Kellogg
Model
EM-722



FACTS!!

The Kellogg EM-722 two-stage air compressor stands the gaff of heavy duty service.

It is built to work year in and year out.

Small running cost — never gives a bit of trouble.

These are FACTS — we can prove them. Ask us to.



**New Kellogg
Air Tower**

Attracts motorists night and day. Air and water service combined. Price only \$60.00.

Kellogg Manufacturing Company ROCHESTER, N. Y., U. S. A.

NEW YORK
112 West 42nd Street

SAN FRANCISCO
1583 Bush Street

CHICAGO
1502 Monadnock Bldg.

CLEVELAND
1108 Hippodrome Bldg.

DALLAS
2006½ Commerce Street

DETROIT
2113 Dime Bank Bldg.

Beyond Compare for Pumping Air

*When the Curtain
rises on the
Automobile Shows-
Just what will
you See?*



Wise dealers will profit by what the Shows teach this year

If you want to know what is going on in the automobile world—watch the shows. They tell, better than anything else, what manufacturers are doing, and what the public is demanding.

This year's shows are particularly important. Wise dealers will follow them with interest to determine how the cars they sell stack up with their competition. They will want to know where they stand.

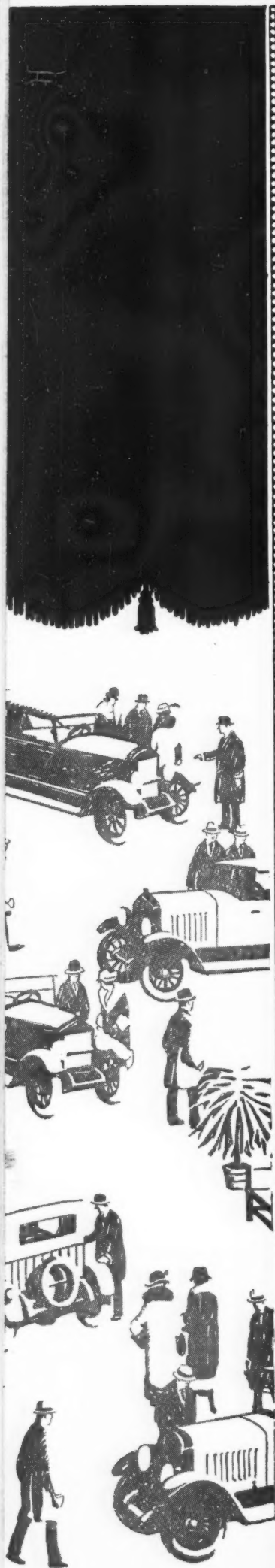
Here are some of the tendencies you will see at the show

- (1) You will notice an increasing tendency toward sixes—particularly light sixes. Both in Europe and America the light, well designed six is being held in higher esteem than ever. The shows prove it in the many new models of this type.
- (2) You will see more than a dozen cars at the show with four-wheel brakes. Others will have them soon. Four-wheel brakes have been popular in Europe for years. Within six months they have taken America by storm. Four-wheel brakes are here to stay.
- (3) You will notice that greater thought and care are being given to body design. Better looking and more comfortable bodies are being built. The problem of more lasting body finishes and better tops have been worked out already by two or three builders.
- (4) You will observe that the proportion of closed cars is still on the increase, and the public demand is for *real* closed cars having uncompromised comfort, refinement, and quality.
- (5) You will see that more attention is being given to those features which make for easier and safer driving. There is a tendency toward the making of controls more accessible for the driver, thereby reducing driving strain and the possibility of accidents to the minimum.
- (6) Note, too, how disc wheels are gaining steadily in popular favor. They are standard equipment on more cars this year than ever before.

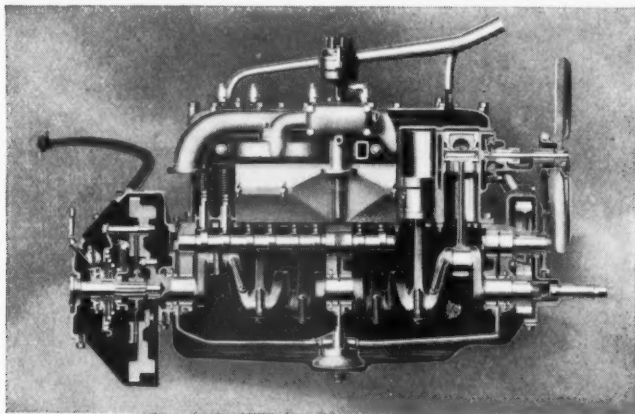
And here is the real evidence of Oakland's advanced design

- (1) Oakland is a pioneer exclusive builder of light sixes. In the new L-head engine, Oakland's years of experience plus the most advanced and proved construction features have been incorporated. Oakland engineers, aided by General Motors experts, have contributed in this engine the last word in light six construction. Comparisons show it. Demonstrations prove it.
- (2) Oakland is the lowest priced six with four-wheel brakes. Oakland's brakes are tried and true. Here is additional evidence that Oakland leads its class in up-to-the-minute construction.
- (3) Oakland's seven new models are distinctive and beautiful. But more than that they have several exclusive and worth while body features. Oakland's new style permanent top is smarter and better fitting; Oakland's special permanent satin-wax finish—more beautiful and indestructible than any you have ever seen—is unmatched at the show; hand tailored side curtains, body hardware, glass covered, indirectly lighted instrument panel and a dozen other features make Oakland a surprise car to all who see it.
- (4) Oakland closed cars are *real* closed cars. They are Fisher-built. They lack nothing in roominess, refinement, beauty or completeness. No compromises in good taste or quality can be found in any of the three models. In addition to the regular closed models there are special Oakland glass enclosures for all open cars. At small cost they give closed car comfort, smart appearance and complete satisfaction.
- (5) Oakland has gone further than any other builder to make the operating of a car convenient and safe. Think of it. All controls, except gearshift lever, are right in front of the driver on the steering wheel. Lighting switch, ignition button, gas lever, choke and horn are neatly grouped in the center of the steering wheel. Compare this arrangement with that on any other car. You'll wonder why all don't have it.
- (6) All models of the True Blue Oakland have five disc wheels as standard equipment.

"Where will you be ten years from today?"



Oakland Features at the Shows which are *Real Show Features*



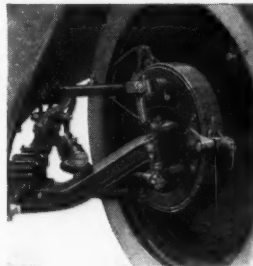
1. Sectional view of the brand new L-head Oakland Six engine. Note new disc clutch, full pressure feed lubrication, and thoroughly advanced construction throughout. The automatic spark advance is one of the important reasons for the smooth, snappy performance of this new engine.



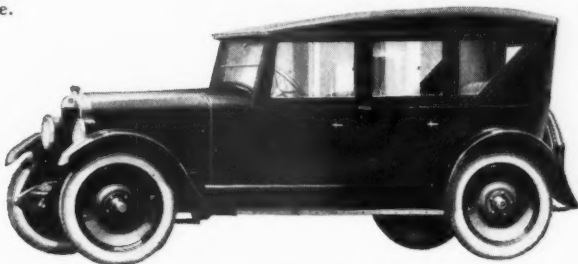
2. All controls, except gearshift lever, are on the steering wheel—a wonderful aid to safe and convenient driving. This is an exclusive Oakland feature.



3. Note superior construction of Oakland's new permanent top. It has a substantial and clean cut appearance and makes side curtains or glass enclosures fit like a glove.



4. This view of one of the front wheel brakes shows the sturdy design of Oakland's practical four-wheel brake construction. No other six at Oakland's price has four-wheel brakes.



5. Here is the touring car equipped with Oakland's new and exclusive glass enclosure. These enclosures fit snugly and are used with the regular permanent top. They actually give closed car comfort at \$60 for touring cars and \$40 for roadsters.

Another innovation which is taking buyers by storm is Oakland's new permanent satin-wax finish. It is actually one of the most remarkable single contributions to the industry to be seen at this year's shows.



Every day is Show day with Oakland dealers

You can readily see from the preceding page why Oakland dealers have been so successful in selling the True Blue Oakland Six.

When buyers step up to this car they can see at a glance the care with which it was designed and built. When they ride in it they appreciate at once how much its advanced features add to the comfort and satisfaction of driving.

No matter what cars the buyer sees in his hunt for the one he wants, he is invariably pleased and impressed with the True Blue Oakland. And this makes the car easier to sell to him.

Every day is a Show day for Oakland dealers, because the True Blue Oakland is a distinctive and unusual automobile whose value is self-evident.

Whether or not you attend one of the shows, make it a point to compare Oakland with other cars. Ask yourself squarely, if it isn't the car in its class which would appeal to you if you were a car buyer. Ask yourself if it isn't the sort of a car that you yourself would like to sell.

Then ask us on the coupon for the complete story. It is barely possible that your territory, and with it a real money making opportunity, are open.

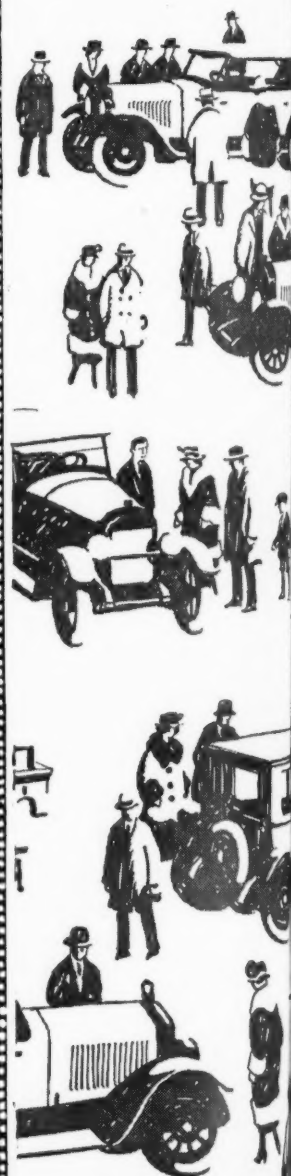
Mail This Coupon Today

Oakland Motor Car Company
Pontiac, Michigan

Please send me the inside facts about the True Blue Oakland and the True Blue Oakland franchise without any obligation on my part.

Name _____

Address _____



STROM

BALL BEARINGS

What this trade-mark on a Ball Bearing means to you—

A STROM trade-mark on a ball bearing means that

- You are getting a bearing which is the first choice of leading engineers in all industries.
- You are getting a bearing which is correctly designed to carry the load and reduce friction to a minimum.
- You are getting a bearing made of special ball bearing steel, heat-treated by the most modern and approved methods (not merely case-hardened).
- You are getting a bearing which is made by skilled workmen in a modern plant and rigidly inspected in every step of its manufacture.
- You have at your disposal—always—all the resources of this great institution devoted solely to manufacturing high-grade ball bearings.

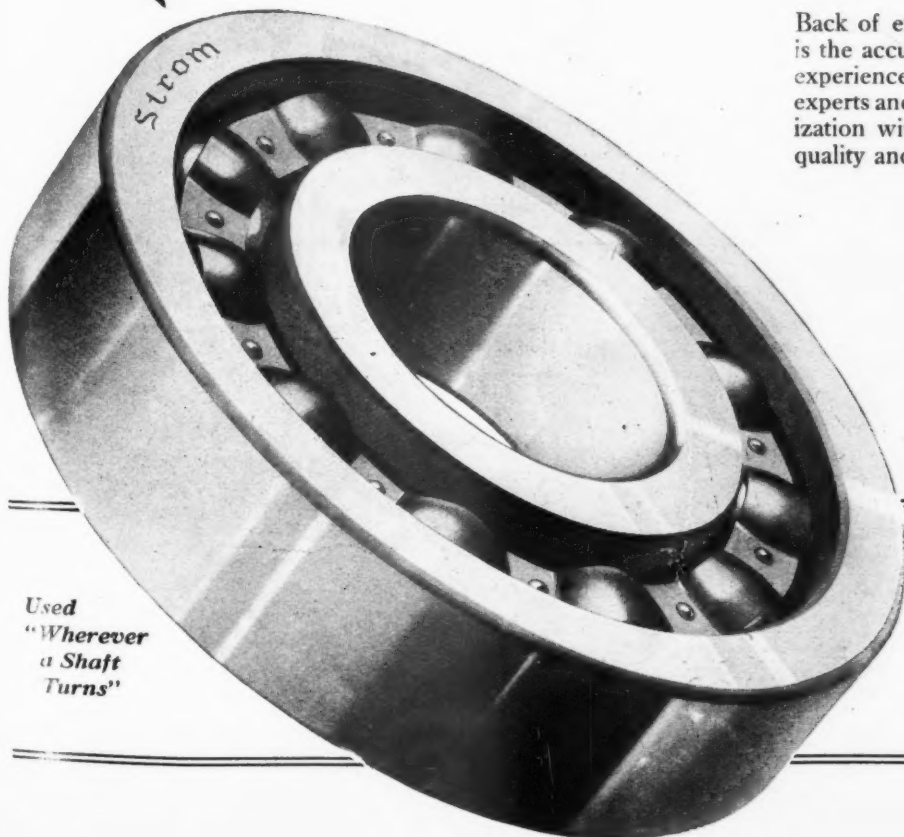
Back of every Strom ball bearing is the accumulated knowledge and experience of a staff of engineering experts and a manufacturing organization with the highest ideals of quality and service.

We offer

- Expert engineering assistance.
- A wide variety of types of ball bearings for all purposes.
- Prompt delivery from stock on standard sizes.
- Our catalog No. 8, giving dimensions and load carrying capacities of Strom ball bearings, as well as other ball bearing literature.

Used
"Wherever
a Shaft
Turns"

U. S. Ball Bearing Mfg. Co.
4551 Palmer St., Chicago, Ill.





TRADE MARK



Biflex Standard
\$26-\$28

Biflex Junior
\$23-\$25

Biflex Special
\$22

Biflex Cub
\$18-\$19

Biflex

Cushion

Bumper

What about your Bumpers in 1924?

Biflex has been the main stay of the industry it created. You recall how Biflex changed the bumper "game" to an industry.

Today, as yesterday, Biflex is the rock of permanence on which the dealer can build for the years ahead.

In looking for a profitable, satisfactory and permanent line of bumpers, consider the guarantees Biflex offers you.

Consider these four things

The Biflex plant—largest in the world, devoted exclusively to bumpers. The Biflex advertising campaign of 1924—greatest ever put behind a bumper. The Biflex organization—keyed to the high pitch of Biflex ideals. And the fact that the Biflex bumper is sold when it comes to you.

Many bumpers, fads or experiments, have come and gone. Others will come and go. But the original Biflex principle, a double bar bumper of spring steel, with full-looped ends, still leads—the standard of the world.

For any car and every car

There is a Biflex Bumper for every one of our 13,000,000 cars. The Biflex dealer has no sales limits. Every motorist in his town is his prospect.

New and Improved Standard Model

The 1924 Biflex Standard has added advantages and selling features. Wider looped ends, which increase resistance and resiliency. Additional length. And a rear bumper construction that brings the bumper closer to the fenders, reducing the hazard of interlocking collision.

Write for detailed information

We will be glad to send without obligation you a complete outline of Biflex sales and advertising plans for 1924. Write the address below.

THE BIFLEX CORPORATION, Waukegan, Ill.

Export Department, 130 W. 42nd St., New York

See Biflex at the
Chicago and New York
Automobile Shows

The Plant Behind
the Biflex Proposition



"Protection with Distinction"

KISSEL

New Berline-Sedan, New Victoria Hydraulic Four Wheel Brakes Balloon Tires

For the past eighteen years Kissel's announcement at the New York Show has signalized the future trend in automobile style and innovation.

True to tradition, Kissel now makes public the fact that Lockheed Four Wheel Hydraulic Brakes and Balloon Tires will be optional on all models, and also discloses for the first time two original body creations of rare beauty and distinctive design—the seven-passenger Berline-Sedan and the five-passenger Victoria.

This announcement makes the Kissel franchise more desirable than ever from the dealer's standpoint. It means that the dealer has a complete line of smart models, moderately priced, with an established reputation in the fine car field. With motor cars of such distinctive style having such a wide appeal and with a good, sound, substantial company behind him, the dealer who identifies himself with Kissel can look forward to a prosperous year.

Unusual interest, therefore, will be centered on the 1924 Kissels, comprising

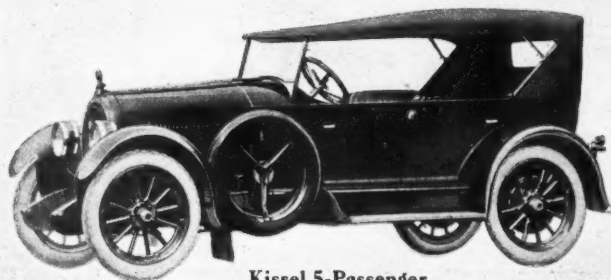
seven models, and on the two new closed cars in particular.

Those who have long admired the distinctive charm of Kissel cars will not fail to recognize in the Berline-Sedan and the Victoria the highest achievement of Kissel skill and craftsmanship. They are cars that do truthfully typify the ultimate degree of motoring luxury.

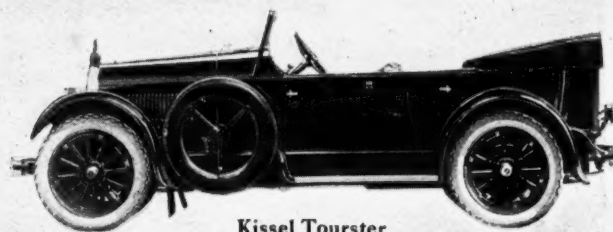
Such exclusive engineering features as specially designed frame with kickup over both axles, automatic oil and thermostatic control, patented spring side play adjustment and bronzed graphited bushings on all moving chassis parts are retained in the 1924 line. And the silent, powerful six-cylinder engine that has made record after record on road and hill the country over remains substantially the same.

The Kissel Motor Car Company, justly proud of its ideals and of its enviable reputation for stability and soundness as an organization of manufacturers and not assemblers, confidently believes that nowhere is there anything comparable to the 1924 line; either in appearance or value.

KISSEL MOTOR CAR COMPANY
Hartford, Wisconsin



Kissel 5-Passenger
Phaeton



Kissel Tourster

The Custom Built Car



New Kissel Records

15 consecutive round trips between Los Angeles and San Francisco—13,050 miles in 30 days—with the same car and same driver!

From Merced over the 5,390-foot elevation into Yosemite Valley in high gear, the only car ever to accomplish this feat!

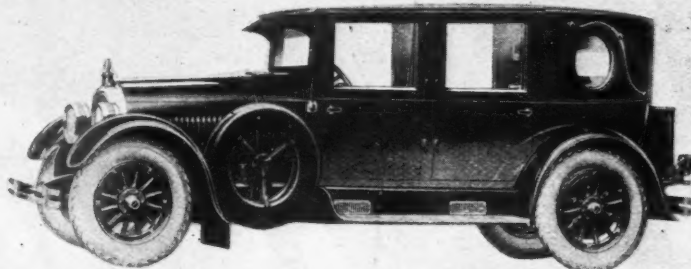
Around the 144 tortuous, climbing curves to the 5,886-foot summit of Mount Wilson in high gear!

The only car ever to climb the 29 per cent grade of the Baxter Street Hill, Los Angeles, in high gear without a clutch pedal, carrying full equipment and two passengers!

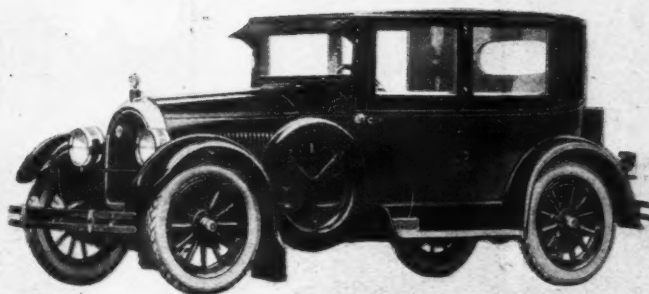
From Los Angeles to San Diego, to El Centro, through the Imperial Valley to Riverside and return to Los Angeles—503 miles, in second gear in 16 hours 17 minutes, averaging 30.896 miles per hour!

From Los Angeles to San Francisco and return, a total of 872 miles, in 26 hours 18 minutes, an average of 33.38 miles per hour, in second gear—breaking every known second gear record in the world!

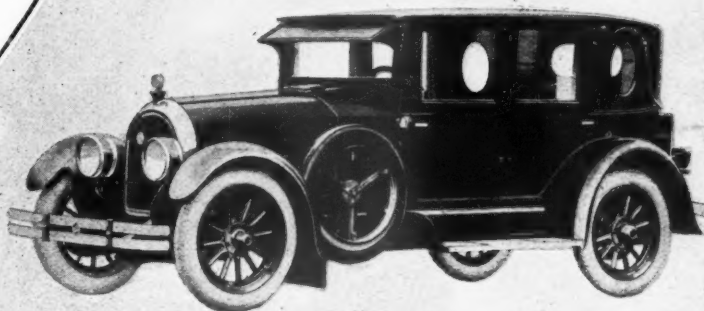
All previous Los Angeles to Phoenix records beaten by 1 hr. 15 min. — officially checked. Trip, 671 miles. But Kissel speedometer showed 694 miles on account of bad roads, which makes record all the more remarkable. Strictly stock car used. Time: 20 hrs. 3 min., including all stops.



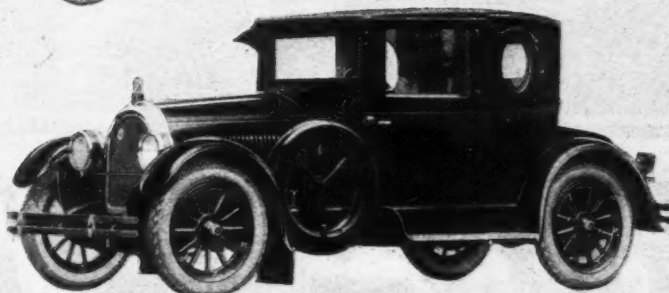
Kissel 7-Passenger
Berline-Sedan



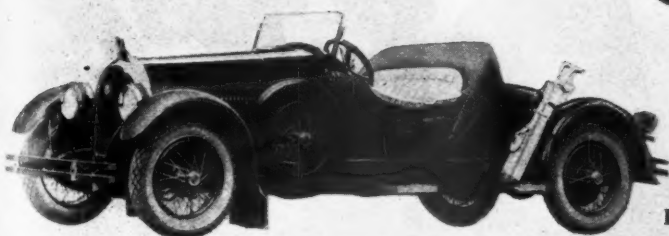
Kissel Victoria



Kissel
Brougham Sedan



Kissel Coupe



Kissel Speedster



Empire

New Year

Factories — still running twenty-four hours a day.

Output — sufficient to meet the *actual needs* of our regular dealers (without overloading) and of a few new dealers who will be added.

Quality — rigidly maintained—nothing cut but unnecessary expense and burdensome overhead.

Prices — to the dealer—readjusted so that he can face 1924 prepared to meet any competition and still make a satisfactory profit.

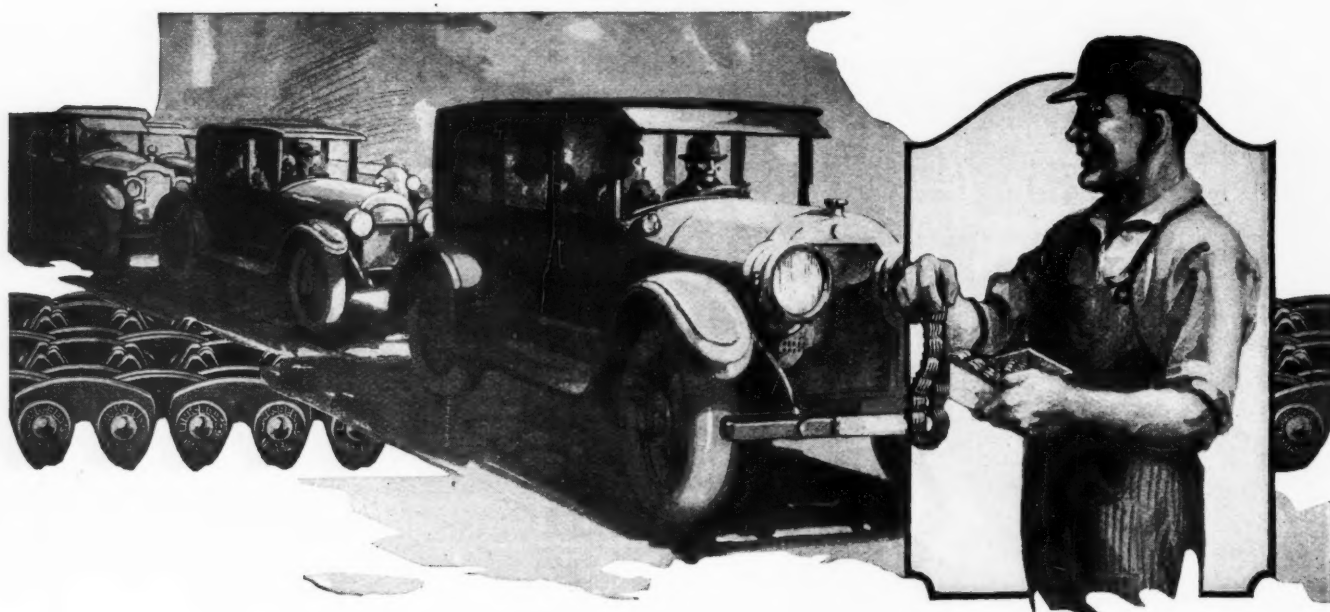
*Which means a
Happy New Year
to Empire Dealers*

and to a few more independent dealers in communities where authorized Empire Agencies have not yet been established.

For exclusive dealers' proposition, write

Empire Tire and Rubber Corporation
Trenton, N. J.

"Wear Longest" TIRES



For All Cars—Any Make; Any Model

THE general acceptance of Silent Chain as the quiet "front-end" drive, and the enthusiastic, widespread demand for the Link-Belt product, has led us to extend our line.

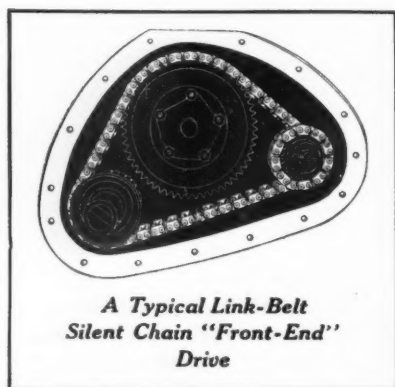
We are now prepared to furnish a genuine Link-Belt Silent Chain to fit any motor, the front-end of which is now driven with a silent chain drive—for replacement, or use in the re-conditioning of the motor.

All Link-Belt chains are thoroughly inspected, tested, and accurately measured—

they are built to the high standard of quality maintained by Link-Belt. Behind them stands the Link-Belt organization.

They are sold in individual cartons, each chain being wrapped in oil paper. Every Link-Belt Silent Chain, therefore, is always in perfect condition, ready to be placed on the engine for immediate service.

Link-Belt Chains run in either direction. They are quickly and easily installed. For your own protection you should look for our name stamped on each washer.



*A Typical Link-Belt
Silent Chain "Front-End"
Drive*

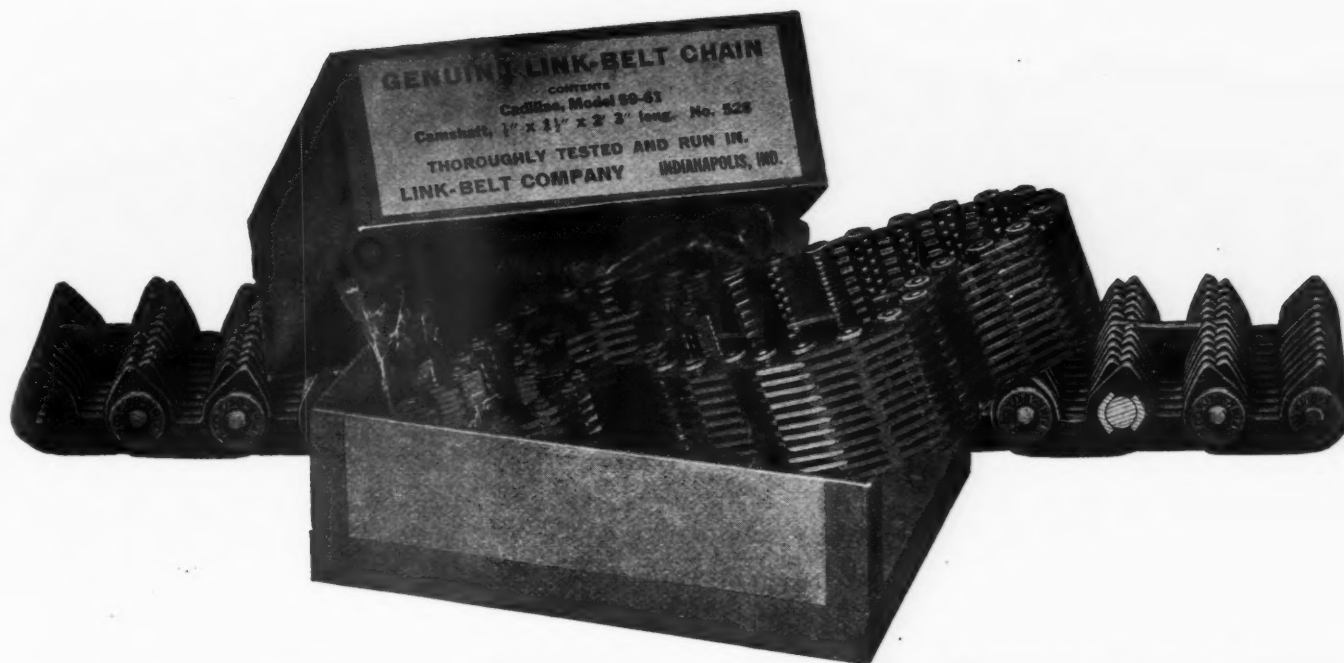
All the facilities of our large manufacturing works, especially equipped for and entirely devoted to making Link-Belt Silent Chain, assure quick service. Prompt delivery is guaranteed.

Link-Belt Company is the world's largest maker of Elevating, Conveying and Power Transmission Chains. Our ability to take care of peak-load demands, therefore, makes Link-Belt authorized distributors a dependable source of supply at all times.

A few choice territories for aggressive distributors are still open for negotiation—yours may be among them. Write for the Link-Belt Silent Chain Distributor's proposition.

LINK-BELT

SILENT CHAIN FRONT-END DRIVES



These Distributors Will Supply You

ALABAMA.
Birmingham Electric Battery Co.,
Southwest corner Ave. B. and 21st St.,
Birmingham, Ala.
Parts Service Corporation,
216 Bibb Street,
Montgomery, Ala.

CALIFORNIA.
Link-Belt Meese & Gottfried Co.,
19th and Harrison Sts.,
San Francisco
400 E. Third St.,
Los Angeles.

COLORADO.
Denver Gear & Parts Co.,
1243 Broadway,
Denver, Colo.

CONNECTICUT
Louis H. Weiner,
1105 Chapel St.,
New Haven, Conn.

FLORIDA.
Auto Parts Company,
125 Clay Street,
Jacksonville, Fla.

GEORGIA.
Gear Specialists, Inc.,
23 West Peachtree Street,
Atlanta, Ga.

ILLINOIS.
Fox Auto Parts Co.,
57 East 26th Street,
Chicago, Ill.

INDIANA.
Auto Equipment Co.,
1021 N. Meridian Street,
Indianapolis, Ind.

IOWA.
The Brackett Company,
545 Fifth Street,
Des Moines, Iowa.
Franklin Sales Co., Inc.,
200-24 North First St.,
Cedar Rapids, Iowa.
Koolish Gear and Parts Company,
312 Jackson Street,
Sioux City, Iowa

Schoitz Tool, Gear & Machine Co.,
Sixth and Jefferson Sts.,
Waterloo, Iowa.
Sieg Company,
500-516 Iowa St.,
Davenport, Iowa.

KANSAS.
KEELE, The Battery Man,
215 West Sixth Street,
Topeka, Kansas.
Wichita Standard Parts Co.,
216 S. Lawrence Ave.,
Wichita, Kansas.

KENTUCKY
Columbia Automotive Parts Co.,
117 S. 7th Street,
Louisville, Ky.

LOUISIANA.
Attakapas Iron Works,
La Fayette, Louisiana.
Standard Motor Parts Co., Inc.,
744 St. Charles St.,
New Orleans, La.

MARYLAND.
Baltimore Hub-Wheel & Mfg. Co.,
Gay St. and Fallsview,
Baltimore, Md.

MASSACHUSETTS.
L. L. Bousquet,
325 Dwight Street,
Springfield, Mass.
City Tire Shop,
18 Church Street,
Worcester, Mass.
The Perrine Co.,
48-50 Cummington St.,
Boston, Mass.

MICHIGAN.
Consolidated Service Co.,
4210 Woodward Ave., at Willis,
Detroit, Mich.

MINNESOTA.
Automotive Service Company,
215 W. Fifth St.,
St. Paul, Minn.
Fenstermacher Automobile Supply Co.,
8 South Ninth Street,
Minneapolis, Minn.

MISSOURI.

Dayton Auto Parts Co.,
1623 McGee Street,
Kansas City, Mo.
S. G. Hoffman Magneto Co.,
3870-74 Washington Blvd.,
St. Louis, Mo.

NEBRASKA.

Auto Electric & Radio Corp.,
2813-17 Harney Street,
Omaha, Neb.

NORTH CAROLINA.
Motor Bearings & Parts Co.,
Raleigh, N. C.

NEW YORK.

Barney's Auto Parts Co., Inc.,
236 West 50th St.,
New York, N. Y.
Branches at Brooklyn, Newark,
Jersey City and Passaic, N. J.
Detroit Supply Co., Inc.,
63-65 Central Avenue,
Albany, N. Y.
Branches at Troy, Schenectady
and Poughkeepsie,
Henry & Ferguson, Inc.,
1439 Main St.,
Buffalo, N. Y.
Lee Electrical Engineering Co.,
205 Pearl Street,
Utica, N. Y.
The Sidney B. Roby Co.,
Rochester, N. Y.
Standard Motor Parts Co.,
107 Otisco Street,
Syracuse, N. Y.
United Gear Manufacturers' Corp.,
1681 Broadway,
New York City, N. Y.

OHIO.

Herbert F. Apple,
427 East Third St.,
Dayton, Ohio.
Dorman Automotive Parts & Gear Co.,
21 East Eighth Street,
Cincinnati, Ohio.
Hawley Sales Company,
624 Jefferson Ave.,
Toledo, Ohio.

Hersch Parts Company,
1966 E. 55th Street,
Cleveland, Ohio.
Ohio Auto Parts & Gear Company,
Corner Fourth and Spring Sts.,
Columbus, Ohio.
Pennsylvania Rubber & Supply Co.,
33 E. Front St.,
200 S. Champion St.,
Youngstown, Ohio.

The Willis Company,
402 Cleveland Ave. N. W.,
Canton, Ohio.

OKLAHOMA.
Sharp Auto Supply Co.,
406 N. Broadway,
Oklahoma City, Okla.

OREGON.
Link-Belt Meese & Gottfried Co.,
67 Front St.,
Portland, Ore.

PENNSYLVANIA.
Geo. M. Biehl,
204 S. Centre Street,
Pottsville, Pa.
Ideal Auto Parts Co.,
1013 Market Street,
Harrisburg, Pa.
Pitt Auto Gear Company,
5906 Penn Avenue,
Pittsburgh, Pa.

Stilley Auto Chain and Equipment Company,
850 N. Broad Street,
Philadelphia, Pa.

RHODE ISLAND.
Providence Car Parts Co.,
219 Fountain St.,
Providence, R. I.

TEXAS.
Motor Parts Depot, Inc.,
1108 E. Ervay Street,
Dallas, Texas.
Branches at Houston, Fort
Worth, Wichita Falls, Waco,
Breckenridge and Beaumont.

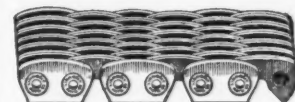
UTAH.
Karl Winter,
713-19 So. State St.,
Salt Lake City, Utah.

VIRGINIA.
Harwick & Company, Inc.,
711 E. Main Street,
Richmond, Va.

WASHINGTON.
Link-Belt Meese & Gottfried Co.,
820 First Ave. S.,
Seattle, Wash.
Geo. H. Weir Co.,
Bellingham, Wash.
DISTRICT OF COLUMBIA.
The Miller-Dudley Company,
1716 Fourteenth Street, N. W.,
Washington, D. C.



Link-Belt
Silent
Chain,
"Back Type".



Link-Belt
Silent
Chain,
"Side Flange
Type".



Link-Belt
Silent
Chain,
"Center-Flange
Type".

Correspondence regarding the Link-Belt proposition
for distributors territory, address—

LINK-BELT COMPANY, INDIANAPOLIS

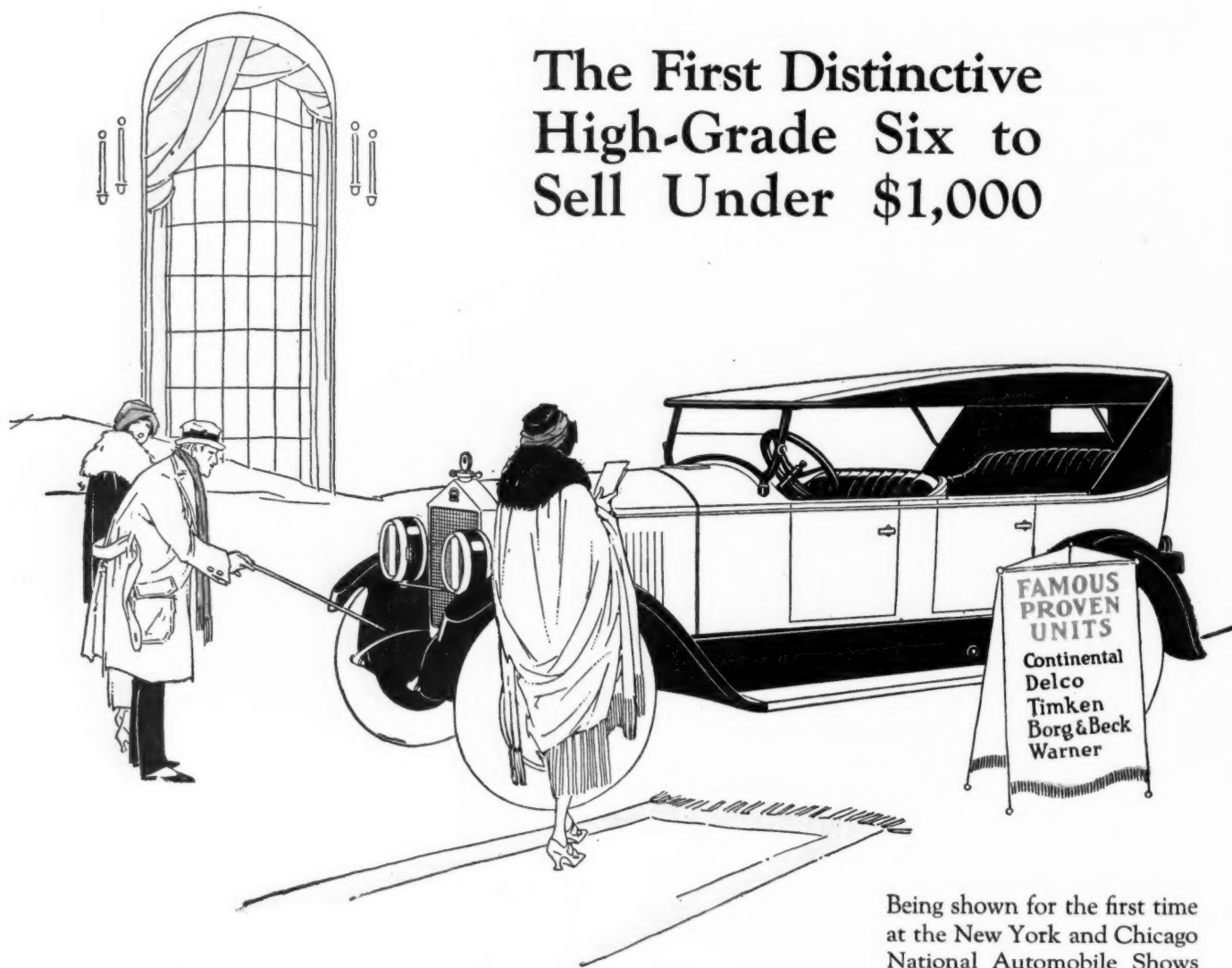
P. O. Box No. 85.

LINK-BELT

SILENT CHAIN FRONT END DRIVES

It's Here! a new **MOON** Six

The First Distinctive
High-Grade Six to
Sell Under \$1,000



Being shown for the first time
at the New York and Chicago
National Automobile Shows

Moon Has Adopted 4-Wheel Hydraulic Brakes—

at \$995

The Lowest Price at Which a Moon Has Ever Sold!

Moon has now completely rounded out its line with a powerful man-size six to sell at \$995—the lowest priced Moon in history! It opens up a great new field of vast proportions. Greatly increases the sales possibilities of every Moon dealer!

There has been no six-cylinder car *at a popular price* that has approached the distinctive beauty of the Moon! People have wanted such a car! It's now here! And it's a Moon! Priced within the reach of all!

See this wonderful new car. It is being shown for the first time at the New York and Chicago National Automobile Shows. The center of interest. The biggest value in the popular car field—backed by Moon's prestige and reputation as builders of high-grade motor cars.

Like the higher priced Moon models, it is a car of famous *proven units*: Special Moon *Continental* Motor, of course. *Delco* starting, lighting and ignition. *Warner* transmission. *Ross* cam-and-lever steering gear. *Borg & Beck* clutch. *Timken* axles and bearings. Moon mechanical excellence throughout. The name Moon has always been associated with America's fine cars.

Not a little six, but a wide, generously proportioned, roomy, comfortable 5-passenger car, with 113-inch wheelbase! Distinctive Moon body lines and silver radiator! Standard Moon body colors! Moon coachwork fineness! Smartly customized enclosed models!

Moon Motor Car Company, St. Louis, U. S. A.

Stewart McDonald, President

Optional on All Models at Additional Cost

The Improved Republic



QUARRIES
USE THEM

LAUNDRIES
USE THEM

JOBBER
USE THEM

PLANTERS
USE THEM

PUBLISHERS
USE THEM

PLASTERERS
USE THEM

SCHOOLS
USE THEM

BOTTLERS
USE THEM

PAVERS
USE THEM

LINEMEN
USE THEM

ROOFERS
USE THEM

BUILDERS
USE THEM

HUCKSTERS
USE THEM

FARMERS
USE THEM

SHIPPERS
USE THEM

We are the owners of eleven trucks, seven of which are Republics; one 2-ton, one 2½-ton and five 1-ton. We manufacture and distribute soft drinks and beverages, and our trucks are never idle; they are continually on the go. As far as speed and economy is concerned, we find that the Republic Trucks have the rest of our trucks beat one hundred per cent, and we certainly can highly recommend the Republic Truck.

We can also highly recommend the prompt attention and service which we obtain on parts.

*Lime Cola Bottling Co.
Wheeling, W. Va.*

ALL LINES
USE THEM

GROCERS
USE THEM

TINNERS
USE THEM

Truck Wins Every Market

BANKS
USE THEM

- the market according to tonnage requirements.* (Republic is a complete and newly improved five-model line.)
- the market according to industrial demand.* (The Republic is already at work in all lines of business.)
- the market according to territory.* (The Republic is in use today in every state in the Union, and in many foreign countries.)
- the market according to traffic conditions.* (The Republic is now operating over all highways, in every variety of city and country service.)

Republic, always an exceptional truck, now establishes new standards of mechanical excellence. The entire chassis shows major betterments and important refinements reflected instantly through

superior power production, reduced maintenance, and greater ease in driving. Today's betterments constitute a final triumph in Republic success.

Republics are now being used in greater numbers than any other truck made by an exclusive truck manufacturer—and the Improved Republic continues to grow in national prominence.

Secure in powerful financial support, with a wealth of experience not equaled in the industry, the present Republic organization is making new conquests.

Republic is national, one of the few really national trucks. Republic is competently made and marketed. And the Improved Republic is a triumph wherever it is shown. These are things to consider before you sign a truck contract.

REPUBLIC MOTOR TRUCK CO., INC., ALMA, MICHIGAN
More Trucks in Use than any other Exclusive Truck Builder

REPUBLIC
Yellow
Chassis
Trucks

Drastic Price Reductions

~~\$1.00~~
Now
50¢
each



~~\$1.25~~

Now

75¢
each



The original compression ring for replacement. Its great flexibility and equal tension mean better performance in worn cylinders.

The original oil reservoir ring for oil-pumpers. Collects excess oil on each down stroke and empties on each up stroke, which ordinary grooved rings cannot do. Use one on each piston.

You can now sell the very best piston ring equipment obtainable to *all* car owners. The new prices place **LEAK-PROOF** and **Superoyl** rings within the reach of everyone.

Think of this!

A complete **LEAK-PROOF**-**Superoyl** Ring equipment for such cars as

FORDS
CHEVROLETS
MAXWELLS only \$**8.00**

They mean a greater volume of piston ring business for cylinder grinders, motor re-conditioning stations, repair shops, service stations and dealers.

Remember

The best profits are in the best parts. Poor replacement parts can ruin a good mechanical job.

MCQUAY-NORRIS MANUFACTURING COMPANY

General Offices, St. Louis, U. S. A.

Factories: St. Louis, Indianapolis, Connersville, Ind., Toronto, Canada



McQUAY-NORRIS

PISTON RINGS - PISTONS - PINS - BEARINGS

DUESE

Special Exhibit

New York Show Week

247 Park Avenue
New York City

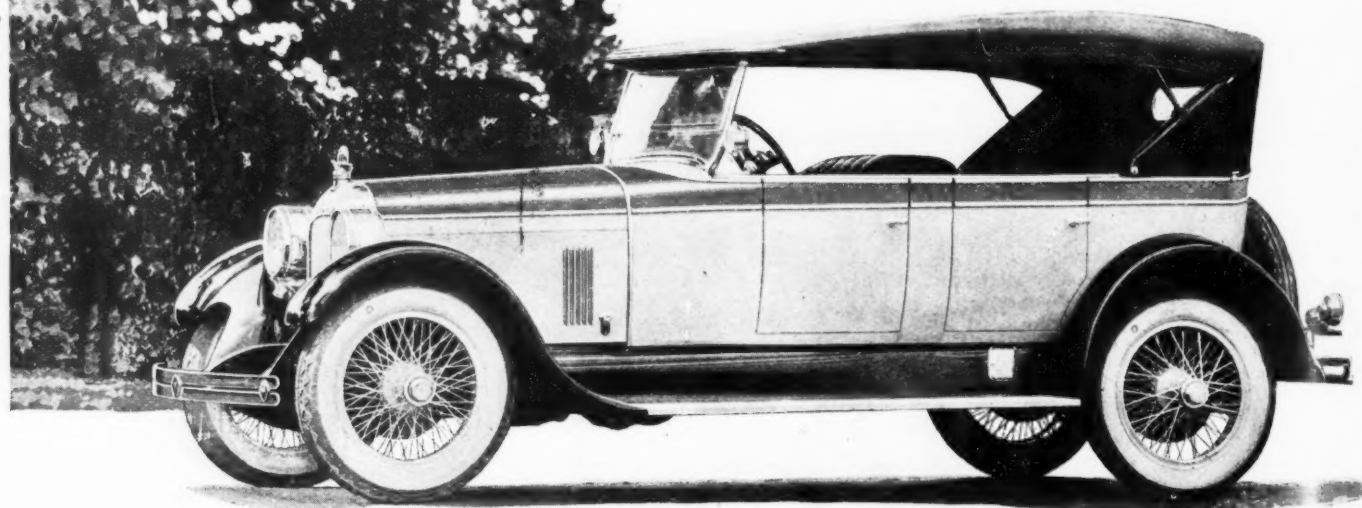
Duesenberg Motor
Sales Corporation

Chicago Salon

Jan. 26 to Feb. 2
Drake Hotel
Chicago

*Factory Sales Department Representa-
tives at Both of these Special Exhibits.*

DUESENBERG AUTOMOBILE
& MOTORS CO., INC.
INDIANAPOLIS

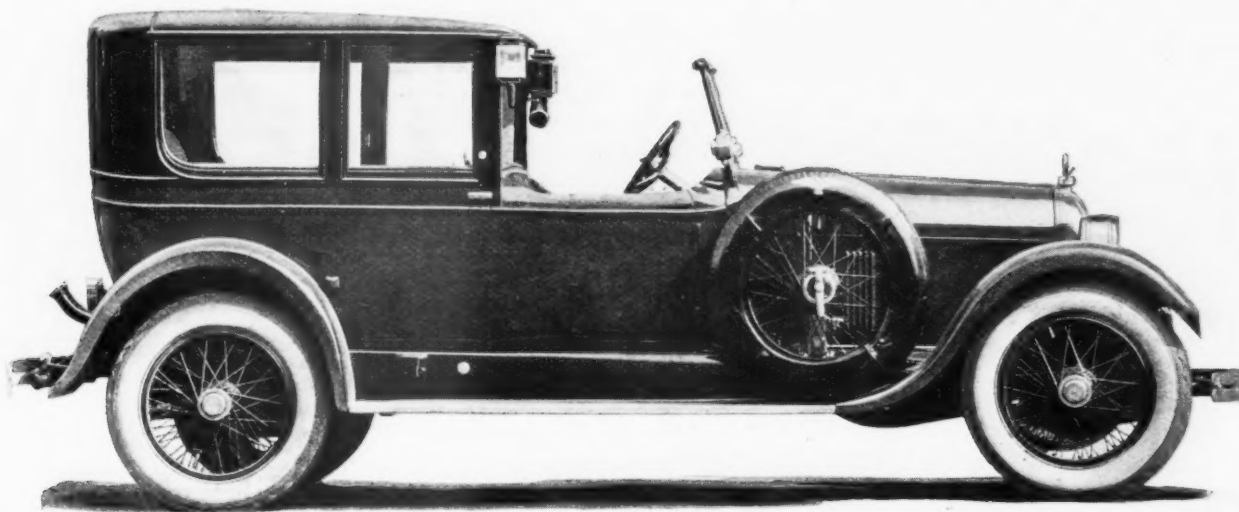


ENBERG

*The Original Straight-Eight
With Four Wheel HYDRAULIC Brakes*

See These Cars During the Shows

Are you ready for the Spring? The Duesenberg is merchandise that appeals to those who insist upon quality and upon performance. Even in small cities of less than 25,000 there is a ready demand. During five months the Siemon Motor Co. of Greensburg, Pa., with three other lines, sold eleven Duesenbergs with a total sales value of \$67,500. That shows the unusual opportunity for real merchandisers. Except in a few instances the metropolitan cities only are now covered by Duesenberg distribution.



The Cramer Manufacturing Company

Announces with Pleasure

Price Reductions and New Items as Follows:

**MILWAUKEE
CIRCULATING WATER PUMP**

for FORD CARS and TRUCKS

Reduced from \$9.50 to \$8.00. In the far West, \$8.50

**MILWAUKEE
CIRCULATING WATER PUMP
FOR THE
FORDSON TRACTOR**

Reduced from \$21.50 to \$18.50

Price Reductions on Above Two Items Effective Jan. 1, 1924

And Here are the New Ones

**Milwaukee
Junior**

for FORDS

Designed for Ford owners who prefer the "Outlet" type of pump

Price \$4.00. In the far West, \$4.25

**MILWAUKEE
CIRCULATING WATER PUMP**

for the OVERLAND FOUR

The Sterling Quality Standard Milwaukee Adapted to Fit the Overland

Price \$8.00. In the far West, \$8.50

— Note —

**The Milwaukee
CRANK SHAFT PULLEY
for FORDS**

is also now an exclusive Jobber's proposition.
A Complete Line to Meet All Demands — and an Exclusive
Jobber's Proposition Throughout

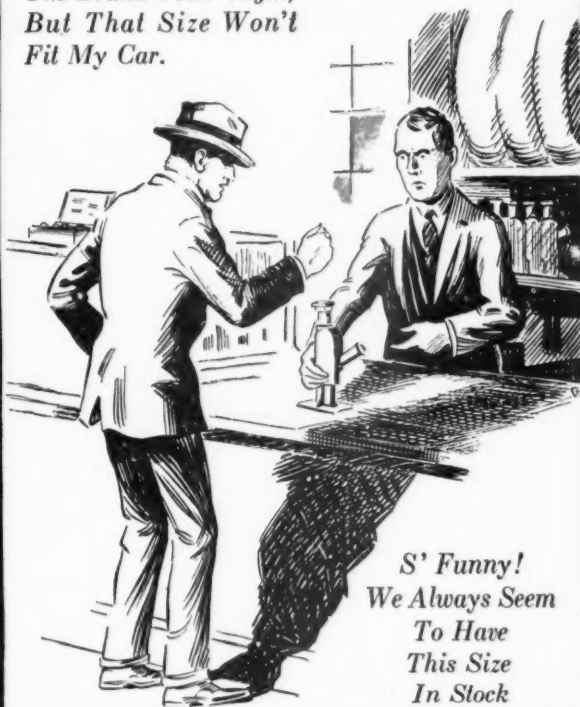
C. N. & F. W. Jonas, Sales Representatives

Cramer Manufacturing Co.

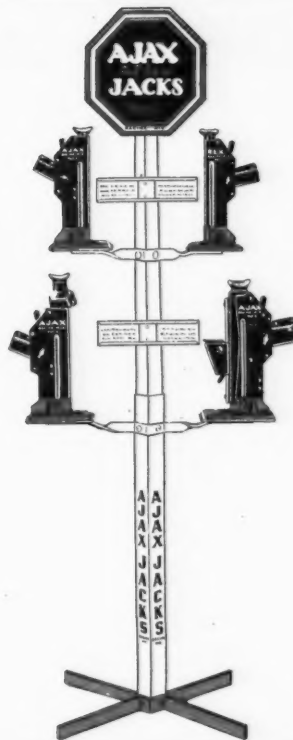
387-9 Tenth St., Milwaukee, Wis.

Are You Still Trying to Sell Those Odd Sizes?

*The Brand's All Right,
But That Size Won't
Fit My Car.*



*S' Funny!
We Always Seem
To Have
This Size
In Stock*



In so called "Complete Lines" you generally find sizes or models that sell much slower than the rest. The demand for them is either very light or has passed out altogether. They are often undetected "stickers" because other models of the same brand are quick sellers. But when you figure up your profits you find that they have tied up your capital and have slowed up the turnover on the whole line—not to mention the sales effort you have wasted on them.

The Ajax Red Base Jack Line is composed of but four jacks. These four jacks meet every jack need in the passenger car field. And every one is a steady seller. The investment required to handle this com-

plete line is less than half what is needed to stock other lines. The rate of turnover on Ajax Jacks is greater because there are no sizes or models for which the demand is slow. Consequently the net profit on the Ajax line is larger than on others.

The Ajax Display Stand shown above is a tireless hard-working salesman. It not only suggests the purchase of a jack to car owners but answers their questions as to proper size, etc. Put this silent salesman to work for you today. Your jobber's salesman will be glad to tell you how you can secure one FREE without making a big investment.

Ajax Jacks are Standard Equipment on Twenty-Two Well Known Makes of Automobiles

Similar Advertisements Appear In Leading Automotive Magazines

Ajax Auto Parts Co., Dept. A-501, Racine, Wis.

AJAX ^{RED} _{BASE} JACKS



Ricken

A ♦ CAR ♦ WORTHY

What Next?

Each season, since the advent of the first Rickenbacker Six, you have looked for and found the key-note to the coming season's engineering features and body styles in the Rickenbacker booth at the annual Automobile Show.

For, it is a remarkable fact that from its inception, Rickenbacker has been an outstanding leader, and fashion-plate.

In advanced engineering features—in body design, in upholstering, finish, and in those little conveniences and appointments so dear to the heart of the experienced motorist—this car has become the standard by which others are judged.

In fact, it has become an axiom, "If you would forecast next year's vogue in motor cars, see this year's Rickenbacker."

Just think back and recall:—

Here, in the Rickenbacker Exhibit, you first learned that "Periods of Vibration"—the most destructive force in a motor car—had finally been eliminated.

Here you first saw a motor with "Tandem Fly Wheels"—two instead of one.

Here, you first saw the "Double—Depth" frame—8 inch side members—now being adopted by the highest priced cars.

Here, you first saw the "Air Cleaner" which excludes dust, sand and other particles from cylinders—also being adopted by several makers.

Here, was first exhibited the "Cradle Spring" installation—which revolutionized the riding qualities of a car.

backer

OF ITS NAME



Here, the first Ball Bearing Steering Spindles in a medium-priced car—which contribute so much to ease of control.

And Rickenbacker first said “4-Wheel Brakes”—the words that you will hear as the refrain of this year’s chorus at the Automobile Shows.

What next? You may well ask!

We choose to give you the pleasure of anticipation rather than the answer at this time.

Why have an Automobile Show if we are to disclose its secrets and surprises in advance?

So, see the others—and then see the Rickenbackers.

Here, you will find epitomized, the best experience, the best methods and the finest engineering discoveries of the world’s laboratories.

At the New York Automobile Show—just to left of main aisle—extending through from second to third lateral aisles—you will find that magnificent Rickenbacker chassis and four standard types of bodies.

Chassis is a triumph of advanced engineering and fine craftsmanship.

Bodies are masterpieces of design and fine finish.

You are cordially invited to inspect the latest Rickenbacker models.

RICKENBACKER MOTOR COMPANY
DETROIT MICHIGAN



Make this a year of More Sales



Government statistics of December first reported 17,000,000 motor vehicles in operation. Production figures indicate that there will be 20,000,000 cars on American highways in 1924.

This will be the biggest year in the history of the tire industry!

Merchants who would get their fair share of this business should investigate the Kokomo proposition because:

The Kokomo Line is complete. Kokomo Tires are sturdy, handsome, durable, saleable. Kokomo dealers benefit constantly from the manufacturer's policy of co-operation. Kokomo dealers are conspicuously successful dealers.

KOKOMO RUBBER CO.

Kokomo, Indiana

Men who desire to build a sound, lucrative tire business should get in touch at once with our sales department. Write today for the attractive Kokomo proposition.



LONG~LIFE
Kokomo
TIRES AND TUBES

Arrow Head

Pistons
Piston Pins
Axle and Drive Shafts



**Dependable
Products**

ARROW HEAD STEEL PRODUCTS CO.

MINNEAPOLIS, MINN., U.S.A.





STARRETT

Micrometers
Cylinder Gages
Dial Test Indicators
Calipers
Thickness Gages
Combination Sets
Steel Tapes
Rules
Ratchet Wrenches, etc.



This year
get the tools you need

BETWEEN you and a profitable business for 1924 stands the question of your equipment.

Get the precision tools that two generations of skilled machinists have relied on.

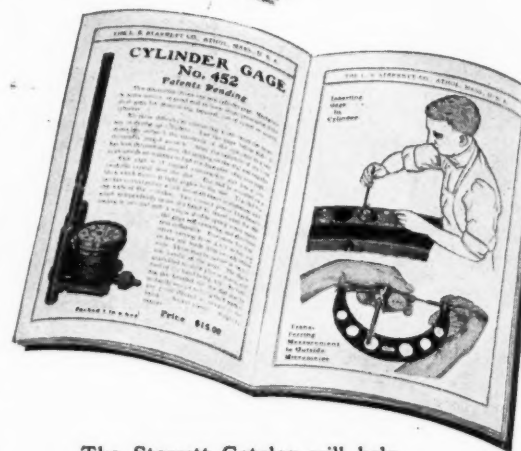
Starrett Tools give you the fine close fits which mark every satisfactory servicing job. Starrett Tools are famous for their accuracy, their convenience and their ability to stand up under rough treatment.

Starrett Tools will help you build a reputation for good work that will keep *your* shop crowded when others are slack. A trip to the hardware store that sells Starrett Tools will pay you handsomely.

THE L. S. STARRETT CO.

*The World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled*

ATHOL, MASS.



The Starrett Catalog will help you in selecting the measuring tools you ought to have. Over 2200 fine precision tools illustrated and described with prices, uses, etc. Write for it. Free. Ask for Catalog No. 22 "R B"

Starrett



Here's A Valuable Sales Aid

CAR BUYERS recognize Perfection Heaters as the standard of car heater value. They know that over half a million Perfection Heaters have proved their quality and utter dependability in service.

Dealers whose cars are fitted with Perfection Heaters find this equipment a distinct sales aid. They are able to sell year 'round comfort as afforded by the nationally recognized and nationally accepted Perfection Heaters.

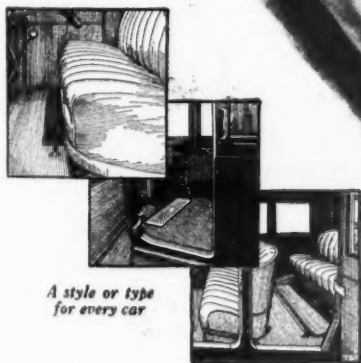
If the cars you handle are not equipped with Perfection Heaters, why not write your factory about this sales advantage?

Until your cars do come Perfection-heated, sell a Perfection Heater with each car. You can also realize additional profit in the sale of Perfection Heaters to the hundreds of car owners coming to your shop for service.

Order from your jobber. He is prepared to give you immediate delivery.

THE PERFECTION HEATER & MANUFACTURING CO.
6545 Carnegie Avenue Cleveland, Ohio

Manufactured in Canada by
Richards-Wilcox Canadian Co., Ltd., London, Ont.



A style or type
for every car

IMPORTANT



The real works of an automobile heater are hidden under the floor. You can't SEE the quality. Your Safeguard is the Perfection nameplate which you will find in plain view on every Perfection Heater. Look for it.

"The heat is there—why not use it?"

PERFECTION MOTOR CAR HEATERS

These manufacturers provide real winter driving comfort by equipping their closed models with Perfection Heaters without extra charge.

Auburn
Buick 4-Cyl.
Buick 6-Cyl.
Case

Cunningham
Dorris
Duesenberg
Durant-4

Earl
Elcar
Elgin
Flint-6

Fox
Gardner
Henney-6
Hupmobile

King
Kissel
Kline
Mercer

Meteor
McFarlan
Moon
Nash 4 and 6-Cyl.
National
Oakland

Paige
Pilot
Premier
R & V Knight
Standard "8"
Stephens

Sterling-Knight
Stevens-Duryea
Studebaker
Templar
Vellie
Winton

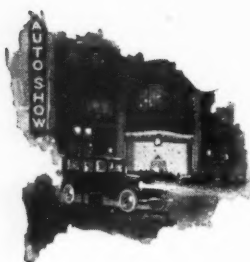
Taxi Cab Equipment

Anchor Top &
Body Co.
Barley Motor
Car Co.

Elkhart Motor Co.
Premier Motor Corp.
Rauch & Lang, Inc.
Yellow Cab Mfg. Co.

new prices on BUNTING BUSHING BEARINGS

P A T E N T E D



NEW low prices on Bunting Piston Pin and Spring Bolt bushings (effective December 1, 1923) make the Bunting line of automotive replacement bushings doubly attractive to jobber, service man and car owner.

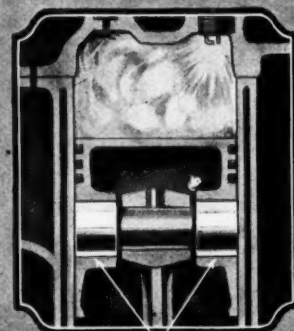
The drastic cut is made possible by the tremendous volume now necessary to meet the demand from all classes in the replacement trade for Bunting quality and Bunting service.

Automotive Jobbers—Have you noted today's prices on Bunting Bushings? Write for Stock List 18 showing Piston Pin bushings and Stock List 111 showing Spring Bolt bushings for all popular automotive vehicles, and latest prices.

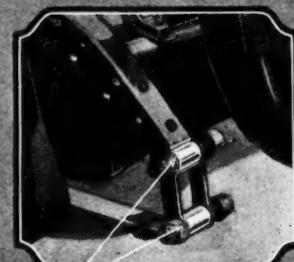
THE BUNTING BRASS & BRONZE COMPANY
TOLEDO, OHIO

Branches and Warehouses at

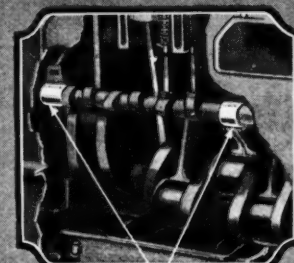
NEW YORK 245 W. 54th St. Circle 0844	CHICAGO 722 S. Michigan Ave. Wabash 9153	CLEVELAND 710 St. Clair Ave. N.E. Main 5991
SAN FRANCISCO 198 Second St. Douglas 6245	BOSTON 36 Oliver St. Main 8488	



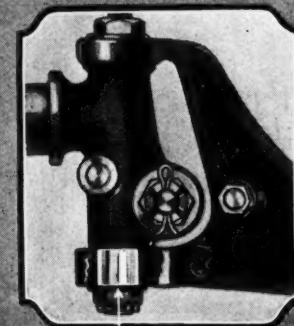
The first essential to a quiet motor is dependable Bunting Bushings to protect the piston and piston pin from the incessant shocks of operation.



Freedom from spring bolt rattles is permanently assured when spring bolts are sized with Bunting Bushings.



Precision in timing is possible only when the cam shaft bushings fit snugly. Bunting Bushings give long and satisfactory service at this important point.



Bunting Bushings on the steering knuckle contribute much to positive, responsive action of the steering mechanism.



You won't find any Bunting Bushings in a run-down car.

—Bunting Bushings



Have you tried this plan?

—keep one Reliable on the counter and the rest where the customer can see them

"The greater the number of customers who handle a Reliable Jack on my counter, the more sales I make," reports one progressive dealer. "I always keep one Reliable on the counter and the rest of my supply in plain view."

Have you tried this plan of selling more jacks? Give it a trial today—one day is enough to convince you.

Customers always like to handle things which are left on the counter, so why not cash in on this habit and let them play with a Reliable Jack? When they are handling the jack, you can "ask 'em to buy."

Lots of times a customer is in need of a good jack, but has put off buying it or has forgotten about it. A Reliable on the counter will remind him of

his need, and the chances are he will buy the jack then and there.

Reliable Jacks Sell Themselves

If your customer doesn't want the same size jack as you have on your counter, show him the other Reliabilities on your shelves. The No. 9 for light cars—the No. 46 for heavier cars—or the new No. 5-A with its 34-inch detachable folding handle. It will be easy to sell him one of these good jacks.

* * * *

Over 5,000,000 Reliable Jacks have already been sold. Are you getting your share of the profits of the sixth million? Write for our catalog and price list and get started now.

Elite Manufacturing Company, Dept. MA-1, Ashland, Ohio

Northwest Branch—G. A. Ashton Co., St. Paul, Minn.

(Complete stock carried in Ashton Building.)

Southwest Branch—Carroll & Co., Dallas, Texas.

(Complete stock carried in Carroll Warehouse.)

REPRESENTATIVES:

Motor Products Co., 149 Church Street, New York.

L. E. Spencer Co., 704 Stahlman Building, Nashville, Tenn.

A. E. Mohrig, 1454 Pine Street, San Francisco, Cal.



No. 5 A



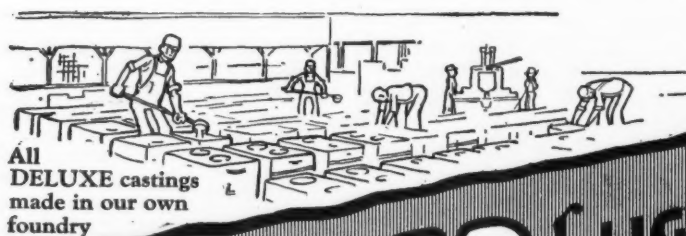
No. 9



No. 46

RELIABLE JACKS

"They Cost no More than Ordinary Heavy Pistons"



BETTER (LIGHT WEIGHT) PISTONS

DELUXE Pistons Better than ever!

Every year produces better cars. Just so, by the experience of making a million pistons and after four years most exhaustive investigation we have produced a better lightweight piston which overcomes all difficulties and gives most amazing results in motor power, flexibility and speed.

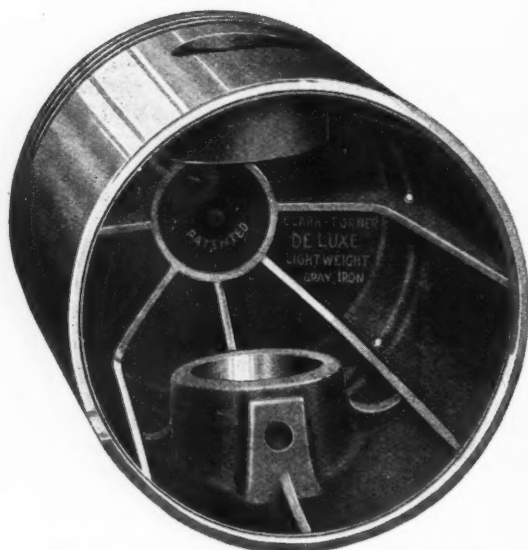
The improved DELUXE has:

BETTER uniformity and a higher grade of cast iron, hence easier and smoother grinding and machining

BETTER distribution of metal, greater strength of wall and backing of head reinforced throughout.

BETTER workmanship, inspection and accuracy.

BETTER heads, thicker in proportion to size of piston and with sunk centers.



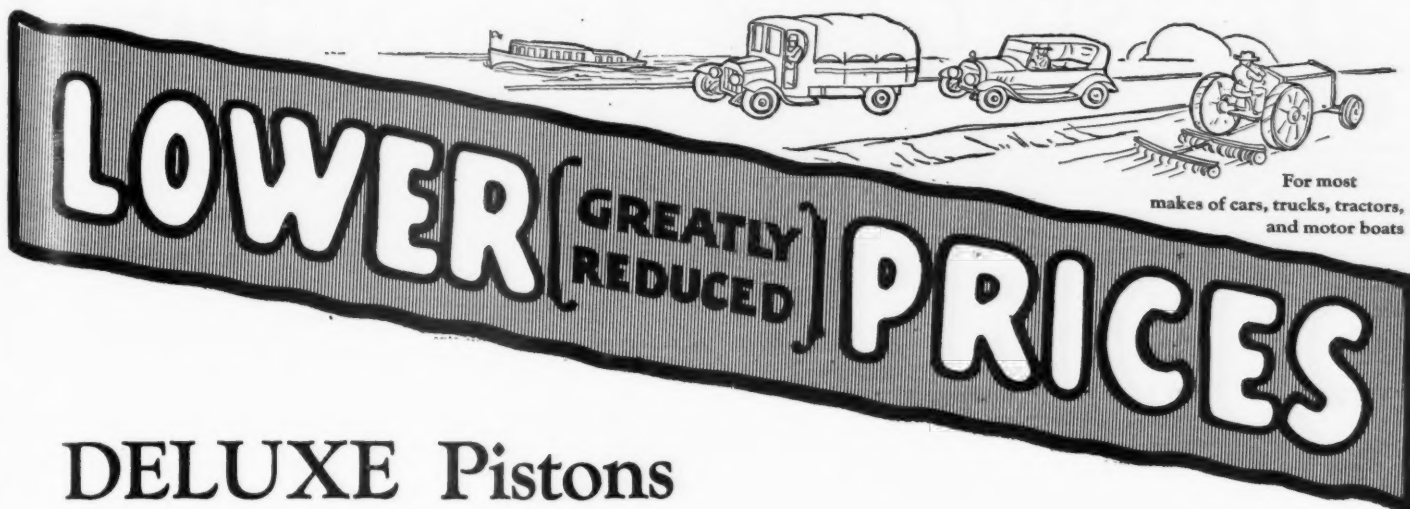
Interior view of new improved DELUXE
Piston made for over 1500 kinds of
motor cars, trucks, tractors,
and motor boats

DELUXE LIGHT WEIGHT

The improvements will increase the immense popularity of the DELUXE among car owners. Over a million have already been installed in the United States and foreign countries

Clark-Turner Piston Co. (inc.) Los Angeles, Calif.

"They Cost no More than Ordinary Heavy Pistons"



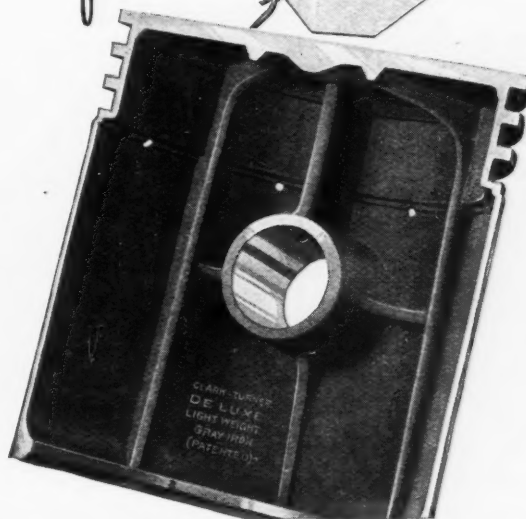
DELUXE Pistons Reduced in Price

After January 1st, we announce a big REDUCTION in price. This is due to many economies we have effected in all departments of our factory and to increased production caused by the growing popularity of DELUXE Pistons.

Our previous experience has taught us not only *How to Produce* the strongest and lightest piston but has shown us *How to Make the Price so Low* that ordinary heavy pistons need never be considered as price competition. At the same time our new lower prices allow you a PROFIT worth having. The new improved DELUXE Pistons are meeting with great approval everywhere and bring trade to you.

Jobbers, Dealers and Re-grinders:

Our Sales and Exclusive Territory proposition is the most satisfactory and profitable in the whole Piston replacement line-up. Write us for it today.



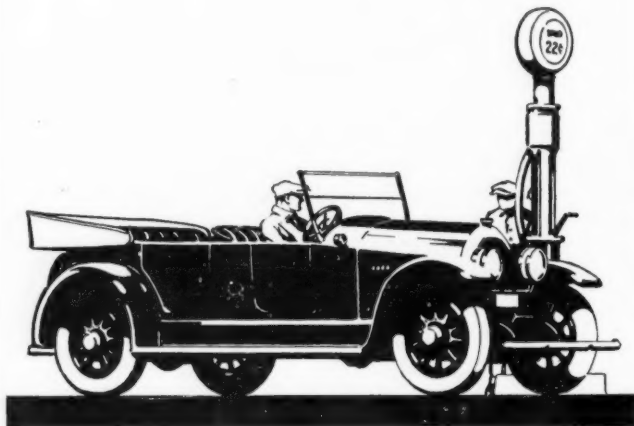
CAST IRON PISTONS

Send for this cut sample today. It shows the new improved construction of the pioneer and most popular of light weight pistons

Send a cut sample DELUXE Piston free to
Name (Trade only).....
Address

CLARK-TURNER PISTON CO.
Box 1080, Arcade Station, Los Angeles, California

It Isn't the Gasoline It's the Tillotson



Any grade of gasoline works well in a new non-air-valve Tillotson Carburetor. High test, low test, New Navy—anything. It's all the same to this new, record-breaking, high-mileage Tillotson. Split-second starting. An engine full of snap and vigor. And a total of miles per gallon that amazes veteran drivers.

Older carburetor types in the hands of experts cannot show the gasoline economy that distinguishes the new non-air-valve in the cars of average drivers.

Investigate Tillotson! Saleable merchandise. Liberal discounts. 100% factory co-operation. The carburetor that gets more action from much less gasoline. Write today for details.

TILLOTSON MANUFACTURING CO. • TOLEDO

Tillotson
CARBURETOR



In Stock

not over a day away!



There's one of our 400 "Milwaukee" distributors near you, with a full stock of these great bearings. Maybe he's only an hour away. Wouldn't it pay to know?

It helps to have our handy Bearing Guide-Book which lists cars, trucks and tractors, with bearing stock numbers for each. Sure we'll mail you one, with the name of your nearest distributor. Write him—wire him—phone him—and your wants are filled at once. What's your address?

"I want my car!"

Suppose he is unreasonable! Suppose he *did* clatter in with his crankcase full of babbitt and want the job done sooner than he had any right to expect! Arguments are all well and good, *but he wants his car.*

That's just where Milwaukee Bearing Service—"not over a day away"—comes in.

You can give him as fine a set of bearings as he ever had—start putting 'em in within a few hours after you call us—and what's also mighty, mighty important—

You can make a good profit on them.

MILWAUKEE DIE CASTING CO., Milwaukee, Wis.

MILWAUKEE **BEARINGS**

TWINS OF POWER

Patented
July 20, 1920



The Oil Groove Ring that Lubricates

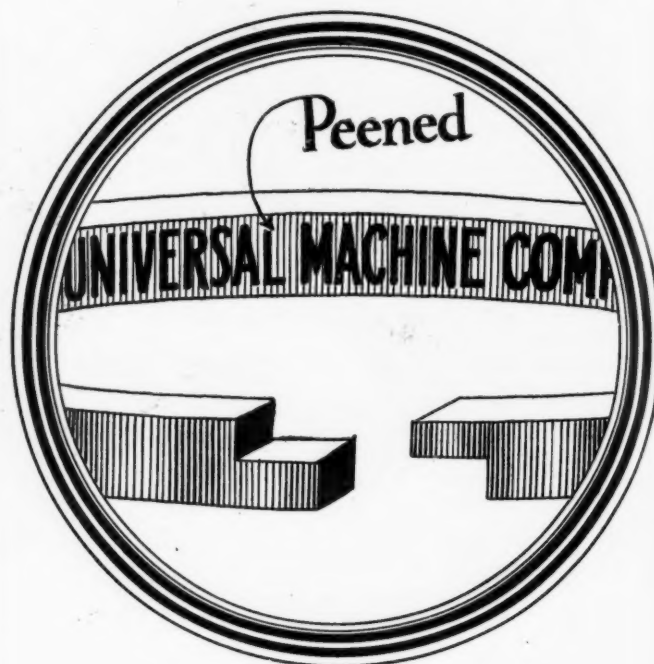
Oil groove prevents "oil-throwing"—Lubrication reduces ring wear to a minimum.

On the upstroke of the piston the beveled edge of the ring collects just enough oil. This is gradually forced by increasing compression into the oil groove where it is held safely at top of stroke, and prevented from entering combustion chamber.

On the downstroke, the oil is again spread thinly over cylinder walls. It forms an oil-seal between the groove and cylinder, effectively preventing compression leakage and providing perfect lubrication.

And this lubrication *must* take place. There are no "ifs" or "buts" about it—it's entirely automatic. That is why these rings are so efficient and why they have a longer life.

*Furnished in either ground
or turned finish.*



Hy-Grade Plain Ring

The Universal Hy-Grade Plain Ring is a ring of very fine quality, yet low in price. It is exceptionally well made of the best materials with a carefully peened interior circumference. It has been used successfully for years and is a dependable ring at a low price.

One Universal oil groove ring at the top of a piston and Hy-Grade Plain Rings in the remaining grooves makes an unbeatable combination.

*Furnished in either ground
or turned finish.*

Dealers: Here are two rings of proven superiority which fill quality or price requirements or both. Universal Rings are backed by sound, ample advertising and sales help—We have a very attractive jobbers' proposition. Write us today.

Universal Machine Company
Baltimore, Md.

UNIVERSAL

ONE PIECE PISTON RING

Templar/

ANNOUNCES TO THE
AUTOMOBILE DEALERS
OF AMERICA THE FIRST
GREAT FORWARD STEP,
REGISTERED IN 20
YEARS IN MERCHAND-
ISING AUTOMOBILES

First in the Field

The Templar Motor Car Company, of Cleveland, establishes precedent here and now for its Plan and Dealers' Association that will end the intolerable conditions under which the Dealer today does business.

What Templar has done must come anyhow, but remember—Templar is first in the Field.

Turn the page!



A NEW DAY WITH A DAWNS FOR AUTOMOBILE

Clear the Decks for Action the Templar Plan is Here!

THE Templar Dealers' Plan and Agreement gives the dealer what he has hoped for, fought for—that to which he is justly entitled—more *real* factory assistance and a better chance to make *real* profits.

1. It gives the dealer full control of his own business and a direct voice and vote in factory policies and manufacture.

2. The Templar franchise is perpetual and protects the dealer from the evil of over-stocking at "off" periods of the year.

3. Protects him fully from loss through price reductions.

4. Protects him against loss in unused parts.

5. Gives the dealer a successful

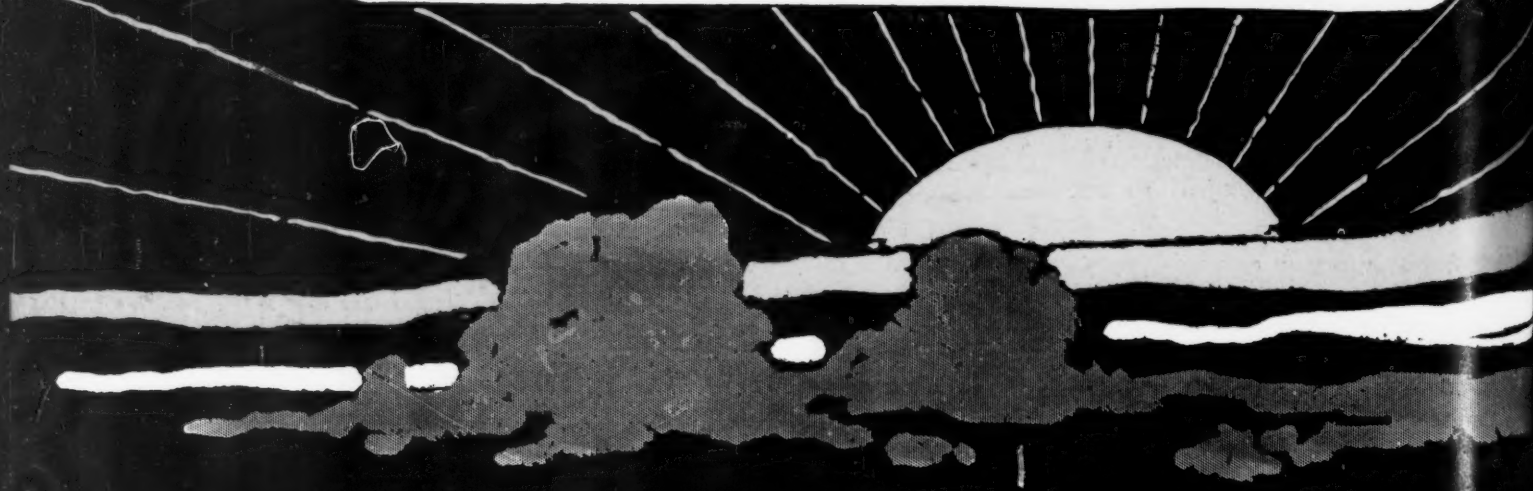
plan that will help move his used car stocks and help banish the "used car bugaboo," one of the vital problems of the whole industry.

6. Gives him an intensive sales plan for forcing out new cars.

7. Gives him national newspaper and magazine advertising; gives him a direct mail co-operative consumer campaign.

8. Gives him individual rights he has never enjoyed in the whole history of the industry.

THE TEMPLAR MOTOR CAR COMPANY, OF CLEVELAND, OHIO, CLAIMS LEADERSHIP AND DOES NOW ESTABLISH PRECEDENT FOR THE TEMPLAR DEALERS' ASSOCIATION, A UNIQUE ORGANIZATION, DESIGNED TO GIVE DEALERS THOSE THINGS THEY MUST HAVE IN THE HIGHLY COMPETITIVE YEAR OF 1924, IN ORDER TO MAKE MONEY.



NEW OPPORTUNITY DEALERS EVERYWHERE

Templar Fires First Gun at the New York Show

THE New Templar Six Car, to be nationally advertised as the "Six-Year Six," is guaranteed for two years.

The first Templar Four ever built is running today. It's a great *small* car. The New Templar Six is a greater and a *larger* car!

1. The Templar engine is guaranteed for 20,000 miles or two years against replacing any part of it.

2. Templar bearings are guaranteed 20,000 miles or two years against replacement, parts and labor free.

3. The Templar axle is guaranteed against replacement or adjustment for 25,000 miles, material and labor free.

4. The Templar is built to run 100,000 miles before it is a "used car"; built to give its owner six years of service before it is a "trade in."

5. Templar is built to pay back its depreciation in full.


6. Templar has four wheel brakes, a seven bearing crankshaft, is European in design.

7. Templar was the first American built stock car exhibited to the public with four wheel brakes.

8. Templar's front wheel brakes are the only brakes on the market equalized in the front axle.

9. Templar excels in dollar value and competes with higher priced cars. With all of this the new Templar "Six-Year Six" will sell for *less* than the old price of the Templar Four.

Decide today. Ask for specifications today. Do it today.



THE TEMPLAR "SIX-YEAR SIX"
will be on display at NEW YORK, PHILADELPHIA,
CHICAGO, CLEVELAND, BOSTON and other shows

The New **Templar** Company

is backed by new and strong capital, a new and strong organization; new and strong men, new methods, new policies, new ideals

THIS new company with a plant worth millions is ready through its president, T. L. Hausmann, to counsel and advise all Templar dealers in their local financial problems.

It is ready to make the problems of worth-while dealers its own problems, provided such dealers are worth-while men.

It is ready to relieve dealers of the ever-increasing burden being thrust upon them. It is ready to help them to put the merchandis-

ing of automobiles on a business basis and to take them out of the specialty field.

You will see the Templar "Six-Year Six" at the shows, but you will want to hear about the *Templar Dealers' Plan and Agreement*, the *Templar Dealers' Association*.

***Therefore, decide to-day!
Act to-day! Write to-day!***

T. L. Hausmann
PRESIDENT

TEMPLAR MOTOR CAR COMPANY

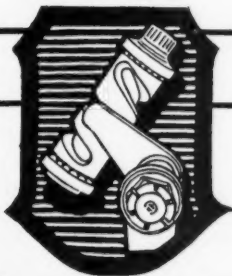
Templar Park

CLEVELAND

OHIO



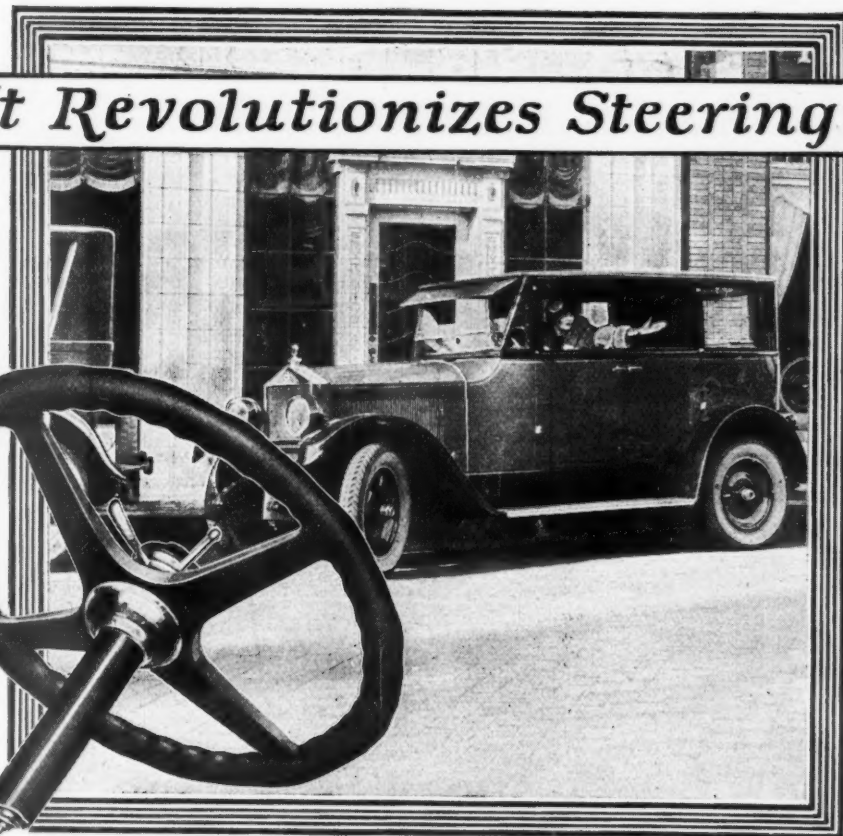
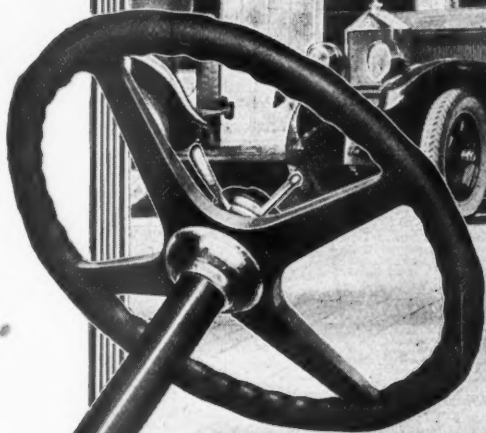
ROSS



CAM & LEVER
Steering Gear
for

Passenger Cars
Motor Buses
Motor Trucks
Fire Trucks
and
Tractors

It Revolutionizes Steering!



*She Backs in Easily
And One Hand's Enough!*

A mean job for anybody—this flat-to-the curb parking! But the new Ross Cam and Lever Steering Gear makes it easy—even for a woman in a heavy car. And with one hand, too!

The Ross cam and lever construction—with the cam's unique variable ratio is the source of the new and remarkable steering advantages that have aroused the keen and appreciative interest of the entire automobile industry. They are revolutionizing steering.

Working together, the cam and lever develop the enormous power that brings undreamed-of ease in steering; the lever motion is automatically accelerated on turns—the cam constitutes an almost impossible barrier to road shock.

And with this new ease comes an added sense of security—a sureness of control under every possible road and traffic condition—that once experienced, can never be forgotten. Write for complete details.



Get The Facts

The Ross Cam and Lever Steering Gear is under test by practically the entire automobile industry—and many leading manufacturers have already adopted it. Every forward-looking manufacturer should get the facts about this remarkable new steering gear. Write today.

[See us at New York Show (Space 222) and Chicago Show (Space 73)]

ROSS GEAR & TOOL COMPANY ~ 400 Heath St. ~ LAFAYETTE, IND.

ROSS
CAM and LEVER STEERING GEARS

EASIER STEERING ~ LESS ROAD SHOCK

OIL-PROOF

THE OIL-TEST PROVES IT



REXOID

TRANSMISSION LINING

FOR FORD CARS

Like every *Thermoid* Product-It Wears

THERE are two things a good transmission lining must do. Wear long and run smoothly. There is one thing it must *not* do. Foul the oil.

We can't *prove* to you that Rexoid outwears other linings or that it makes a Ford Car run like a watch. But if you try Rexoid on a car you won't need any better proof.

As to this oil proposition, you can prove it for yourself without any risk of fouling your car. Soak a piece of Rexoid in the same grade of oil you use for your transmission. At the end of 48 hours you will find the oil still clear.

Try the same thing with several other makes of transmission lining. Some will discolor the oil more than others. All will discolor it to some extent.

That oil test *alone* will show you which lining is best for the car. The other Rexoid superiorities—more material to the square inch, longer life and smoother going—

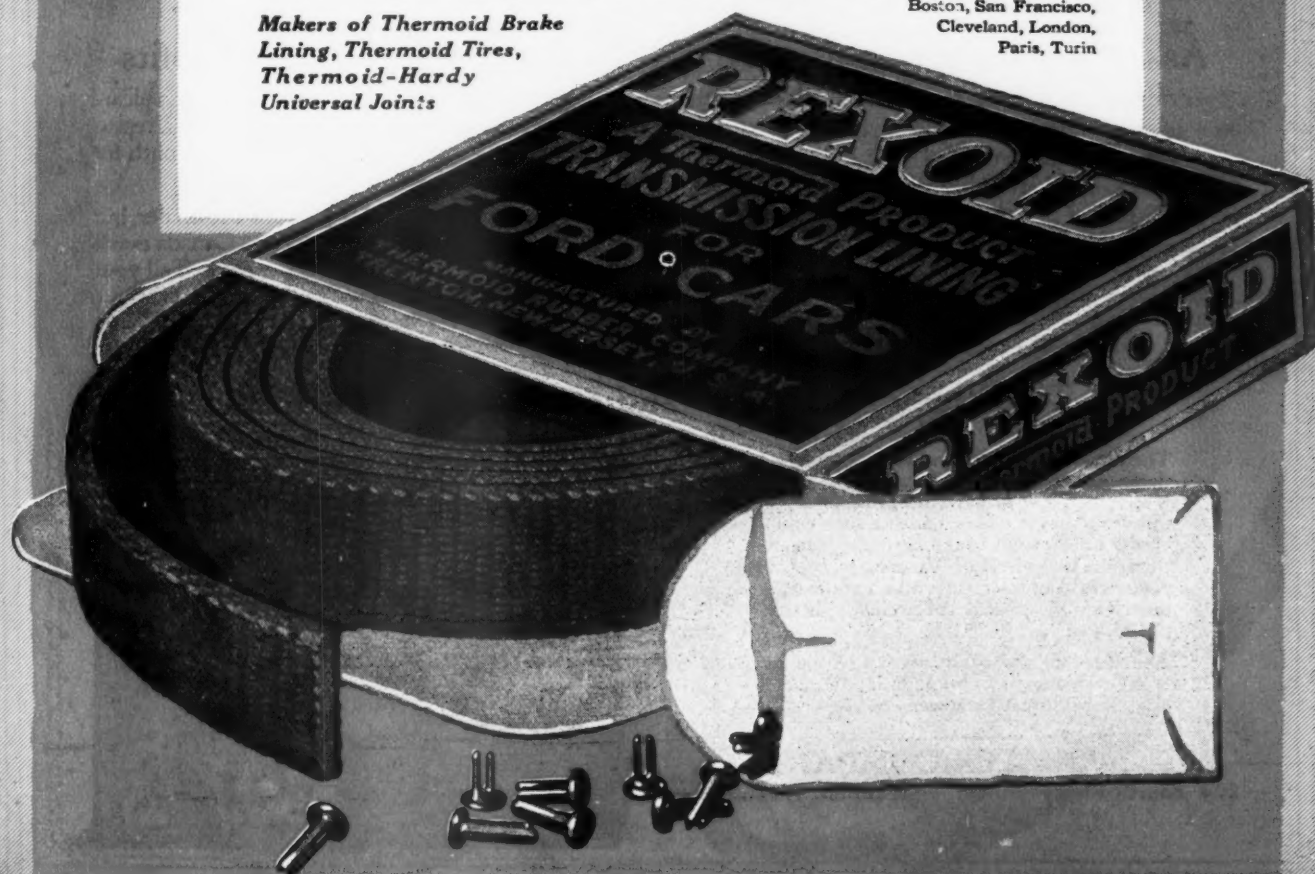
Well, they are certainly not *disadvantages*.

THERMOID RUBBER COMPANY, Trenton, N. J.

New York, Chicago, Los Angeles, Detroit, Atlanta, Seattle, Kansas City,

*Makers of Thermoid Brake
Lining, Thermoid Tires,
Thermoid-Hardy
Universal Joints*

Boston, San Francisco,
Cleveland, London,
Paris, Turin





258th Field
Artillery Armory
the scene of the

New York
Automobile Show
January 5 to 12

The New York Show Lasts Only a Week
But the Attractive

SHALER

FREE SELF-MERCHANDISER

enables every dealer to display the useful Shaler 5-Minute Vulcanizer
in his own store, where his customers can see it every week in the year.

Ask Your Jobber's Salesman

Every dealer should ask his jobber's salesman for one of these attractive Shaler Self-Merchandisers and get the full benefit of our big advertising campaign in national publications during 1924. It is FREE to any dealer who orders only one dozen Shaler 5-Minute Vulcanizers from his jobber.

This attractive Self-Merchandiser, with its demonstration of the Shaler outfit, its operation, and a sample vulcanized repair, makes it easy to sell.

Repeat Sales—Repeat Profits

The Shaler Self-Merchandiser will sell many vulcanizers for you, and every vulcanizer sold means a repeat customer who will come back month after month for more Shaler Patch-&-Heat Units.

Over two and a half million now use the Shaler, but every motorist in the United States and Canada needs it for making quick, permanent tube repairs. Tell your customers to "Vulcanize First and Make it Last" instead of "sticking on" temporary patches. Ask your jobber to send you the Shaler Self-Merchandiser.

This Shaler Self-Merchandiser Asks 'Em to Buy

The Shaler Self-Merchandiser is a complete demonstration of the Shaler 5-Minute Vulcanizer that gets the attention of everyone who sees it. It is made of hardwood, ebony finish, with four color metal front, that puts the 5-Minute Vulcanizer, its simple method of operation, and a real repair on a section of real tube, clearly before the Motorist.

The front of the cabinet is 9 x 14 inches. It is also a compact container and holds a dozen 5-Minute Vulcanizers.

C. A. SHALER COMPANY

204 Fourth Street

Waupun, Wisconsin





BURD PISTON RINGS

**High
Compression
\$1.00**

THE various types of Burd Piston Rings are all made from individual castings, from cycloidal patterns developed in our own foundry, insuring absolute roundness and uniform pressure at all points.

The new process of Burd Cycloidal Pattern Development is the greatest improvement that has been made in piston ring construction during the past decade, and has won the approval of engineers and mechanics everywhere. This new process makes it possible for us to produce out-of-round castings which the most rigid tests have proved are unequalled for efficiency in the manufacture of a uniformly round piston ring; one that will exert equal pressure against the cylinder wall at all points of contact.

Order From Your Jobber!

The mechanics who equip a car with Burd Piston Rings can be positively sure that their customers will be absolutely satisfied. After a correct installation of Burd Piston Rings, there will be no "come-backs," no "after regrets," and no disgruntled customers. Burd Piston Rings are just as essential in a reground job as in a repair job because they insure perfect satisfaction.

Write for Our Latest Price List

Burd Piston Rings are made in all standard and over-diameter sizes—.0025", .005", .010", .015", .020", .025", .030", .035", .040", .045", .050", and .055".

BURD HIGH COMPRESSION RING CO.

Rockford, Illinois

**Quick
Seating
60¢**

**Oil
Ring
60¢**

**Turned
Ring
25¢**

Taking America

SHEER merit and uncommon ability to anticipate public need and desire have made Willys-Overland the richest money-making dealer opportunity of all time.

The new Overland Champion! Nothing comparable in usefulness was ever seen before! Both seats adjustable forward and backward for short or tall people. Big loading space by removing rear seat and upholstery for sample cases, luggage, tools, groceries—anything a salesman, farmer, housewife or anyone else wants to carry. Both seats and upholstery make into full sized bed in car—wonderful for camping. Extreme economy!



Overland

CHAMPION

\$695 Ex. & Toledo
Trunk Extra

*The Most Car
in the World
for the Money*

Off Its Feet

Overland reliability! There is no limit to its many sided sales popularity!

And the sensational Willys-Knight Coupe-Sedan! The new type of car—with doors both front and rear—that made folding seats and seat climbing unnecessary and unpopular. Beautiful! Comfortable! Chummy! With the engine that improves with use! These cars—all of the Willys-Overland cars—offer you the greatest dealer proposition ever built on wheels. Ask for details.

WILLYS-OVERLAND, Inc., TOLEDO, OHIO
Willys-Overland Sales Co. Ltd., Toronto, Canada



WILLYS-KNIGHT

Coupe-Sedan

Standard \$1450 DeLuxe \$1550

E.O. & Toledo

*The Day of
the Knight
is here ~ ~*

"Attaining the Unattainable" and Pocketing the Velvet



LIKE the negro preacher who could "bust the incombustible" and "unscrew the inscrutable" every repairman can now "attain the unattainable" on one job at least.

That's armature rewinding—where heretofore it has been necessary to either turn the job down, or take it with an often resultant loss of profit or customer good-will, he can now make every rewind job a source of "velvet" profit.

Our service makes this possible—Instead of turning the job down or attempting to do the rewinding himself without the many special tools and pieces of extra equipment required, the repairman just takes bearings and end plates off and ships armature to us.

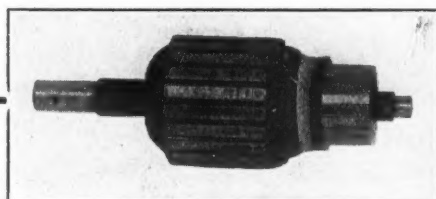
In practically all cases we ship a rewound armature to him the same day old one is received. He puts bearings and end plates back, replaces the armature and pockets the "velvet"—the difference between our bill to him and his bill to his customer—

Due to quantity production, our prices to him (as shown in the price list opposite) are so low that the "velvet" represents a very fair profit. Besides, satisfaction is assured because—

***We Guarantee Every
Armature We Rewind***

Try Us on *your* next Rewind Job.

Our new plant just completed increases our capacity to 1500 rewind jobs a day.

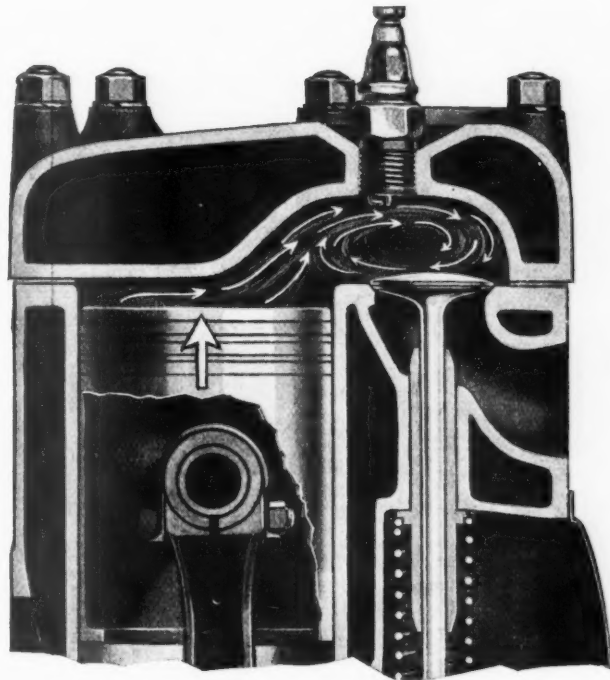


PRICE LIST Net Prices

Ford Generator Armatures.....	\$ 1.95
Ford Starter Armatures.....	2.00
Any Make of Two Unit Generator Armatures.....	4.95
Any Make of Two Unit Starter Armature Rewound.....	6.75
Motor Generator	
Northeast.....	11.00
Simms Huff.....	7.00
Delco.....	12.00
Dyneto.....	12.00
Detroit.....	12.00
Any Vacuum Cleaner Armature.....	3.50

H.M.FREDERICKS CO.
Armature Winding Specialists
Lock Haven Penna.

The Ricardo Head



*United States Patent Granted Nov. 13, 1923
to Waukesha Motor Company as Assignee of
Harry Ralph Ricardo, the English Scientist.*

at automobile shows

CHICAGO NEW YORK BOSTON

and

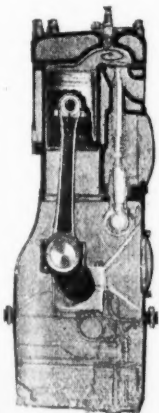
GOOD ROADS SHOW

Waukesha Motor Company

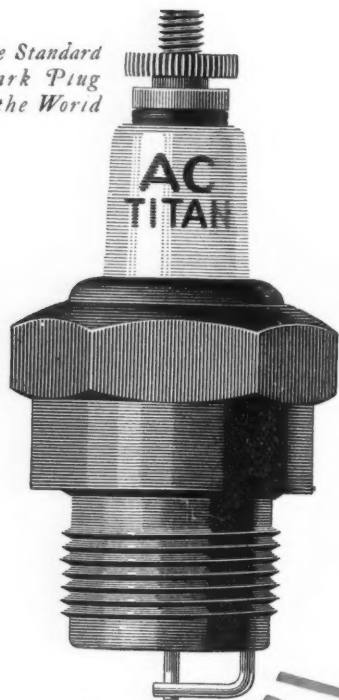
New York
Aeolian Building

Waukesha, Wis.

Detroit
Capitol Theatre Bldg.



*The Standard
Spark Plug
of the World*



More than 85 per cent of all cars produced in this country, Fords excluded, are factory-equipped with AC Spark Plugs.

Ambassador
Anderson
Apperson
Buick
Cadillac
California
Case
Chalmers
Chandler
Checker Cab
Chevrolet
Cleveland
Cole
Collins
Courier
Daniels
Davis
Dodge Brothers
Dort

Duesenberg
DuPont
Durant
Essex
Flint Six
Hanson Six
Hatfield
Haynes
Hudson
Hupmobile
Jordan
Kisse I
LaFayette
Leach
Liberty
Marmon
Maxwell
McFarlan
Nash

National
Noma
Oakland
Oldsmobile
Paige
Piedmont
Pilot
Rock Falls
R & V Knight
Sandow Taxicab
Seneca
Standard Eight
Stanwood
Star
Stearns Knight
Templar
Westcott
Yellow Cab

This tremendous, ready-made market for AC's is right at your door and will always be there in ever increasing size.

SPARK PLUGS



The public has learned the quality of AC Spark Plugs through using them and through AC's strong advertising. The AC line is a safe investment because the market for it is assured by its factory equipment business. The carbon-proof feature of the AC 1075 makes it a better plug for Ford engines.

AC Spark Plug Company, FLINT, *Michigan*

Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915; U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending



SPEEDOMETERS



The accurate, easily installed AC Speedometer can be sold to every Ford owner

Everyone will use Chains more when they discover **OFF'N'ON CHAINS**

For you can put them on and take them off in a hurry. And you can put on a new cross chain quickly anywhere, any time.

This means more chain sales—*more OFF'N'ON Chain sales*—more profits for dealers.

Order from your jobber today. At the same time, spare cross chains should be ordered. You can sell an extra set with every chain.



Write at once for further particulars, giving the name of your jobber.

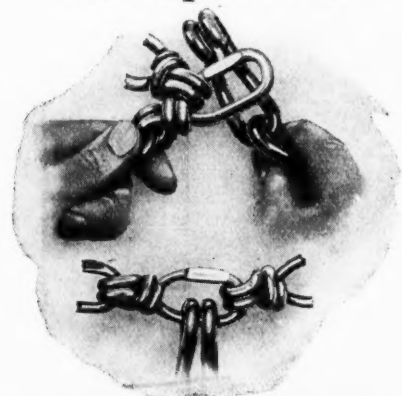
When your fingers close the lever lock the slack is taken up and the chain is absolutely secure.

The Positive Lock



This patented lever lock makes it easy to put them on and to take them off. It takes up slack; thus saves wear on tires and chains alike. No more lost chains—no more loose chains.

The Slip-on Link



This patented slip-on link makes it easy to take off the old cross chain and put on a new one. A child can do it.

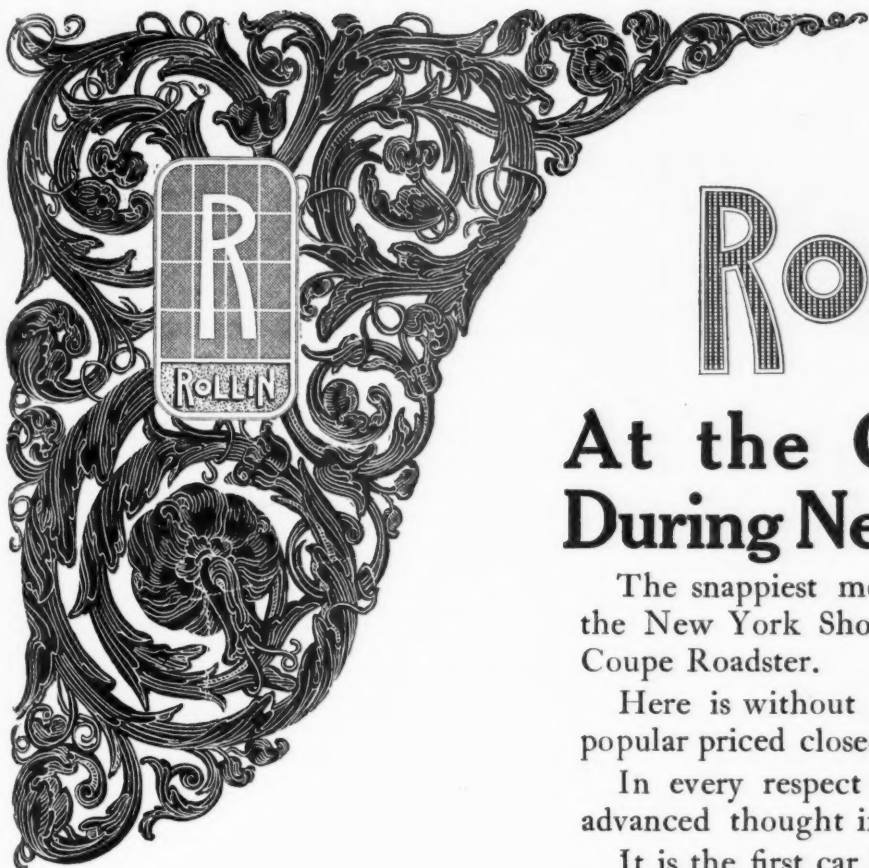
PYRENE MANUFACTURING COMPANY

Makers of Pyrene Fire Extinguishers

520 Belmont Ave., Newark, N. J.

BRANCHES:

CHICAGO—17 So. Jefferson St. KANSAS CITY—2010 Grand Ave.
ATLANTA—164 Spring St. SAN FRANCISCO—977 Mission St.



ROLLIN

At the Commodore During New York Show

The snappiest model to be exhibited during the New York Show will be the new Rollin Coupe Roadster.

Here is without question the most swagger popular priced closed car of the season.

In every respect Rollin represents the most advanced thought in foremost engineering.

It is the first car in America to have that rare combination of European type motor—4-wheel brakes—and balloon tires.

Such unusual merchandising features mean that Rollin is going to be one of the fastest sellers during 1924.

We would like to discuss the Rollin possibilities with progressive dealers.

See us during the New York Show at the Commodore Hotel, (right in the center of the lobby) or at our executive offices in Cleveland.

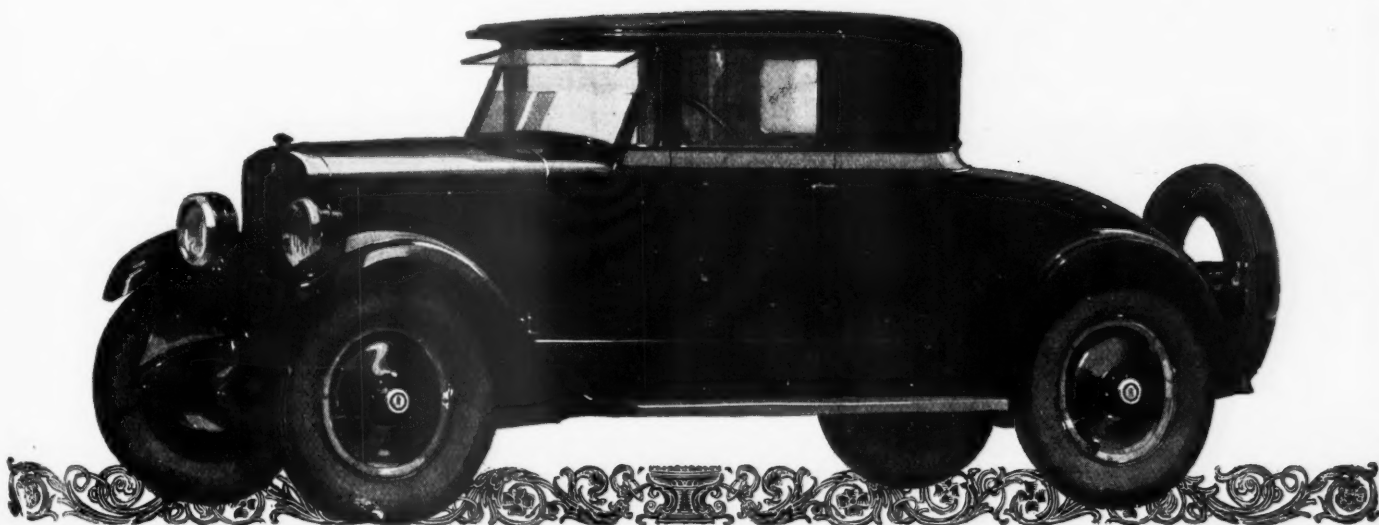
Or in the Elizabethan room Congress Hotel during the Chicago Show.

Touring Car De Luxe.....\$ 975*
Coupe Roadster..... 1175
Five-Passenger Sedan..... 1275

*This same model with wood wheels, cord tires and 4-wheel brakes but without De Luxe equipment.....\$895

Prices f. o. b. factory

THE ROLLIN MOTORS COMPANY
CLEVELAND, OHIO



Stewart Leaders



De Luxe Model 175

Stewart Bumpers

TO satisfactorily meet consumer demand a dealer must carry a well-known, high grade bumper of attractive appearance, reasonably priced, easily installed and made by a reliable firm that can give satisfactory delivery.

Stewart Bumpers fill all these requirements. They are manufactured by a concern known to produce only highest quality products.

A recent large addition to our immense plant increases our facilities and assures dealers of quick delivery in any quantity.

Our 1924 line includes two standard bumper models and special models for Ford, Chevrolet and Overland cars.

Our nation-wide advertising on Stewart Bumpers will be greater than ever before. It will profit you to be ready to meet the demand.

Special Models

Special FORD models
priced from

\$12⁷⁵ to \$16²⁵

Special CHEVROLET
models priced from

\$12²⁵ to \$16⁵⁰

Special OVERLAND "4"
models priced from

\$13²⁵ to \$16²⁵

(Increase in Western
Prices)

STEWART-WARNER SPEEDOMETER CORPORATION
CHICAGO, U. S. A.



Standard Model 201

Stewart

CUSTOMBILT ACCESSORIES

USED ON 9 MILLION CARS

In Nickel Finish
\$23

In Black Finish
\$21

(\$2.50 Increase in
Western Prices)

*See the
Warner
the "Accessory"
New York
Show, Jan. 5th*

In Nickel Finish
\$16⁰⁰

In Black Finish
\$13⁵⁰

(\$2.50 Increase in
Western Prices)

for 1924



Set of four, with red wrench
\$30

Set of two, with red wrench
\$15

(Western prices \$31 and \$15.50)

Stewart Shock Absorbers

THE very latest addition to the quality line of Stewart Accessories. It is different in that it absorbs or slows down the rebound smoothly and quickly with practically no friction on the strap. This minimizes the possibility of strap breakage.

One of the greatest of its many big selling points is the adjustment feature which permits a motorist to tighten or loosen the tension at any time to meet his own riding requirements. A partial turn with the little red wrench does the trick.

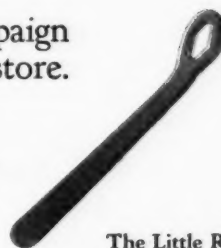
The well designed installation prevents slipping on the car channel. The Stewart Shock Absorber "stays put." Another feature—it is self-lubricating.

A small number of fitting sets, packed separately, will fit a large number of popular car makes—not necessary to carry a big stock.

The greatest shock absorber advertising campaign you've ever seen will bring buyers to your store.

Write for our specification list.

STEWART-WARNER SPEEDOMETER CORPORATION
CHICAGO, U. S. A.



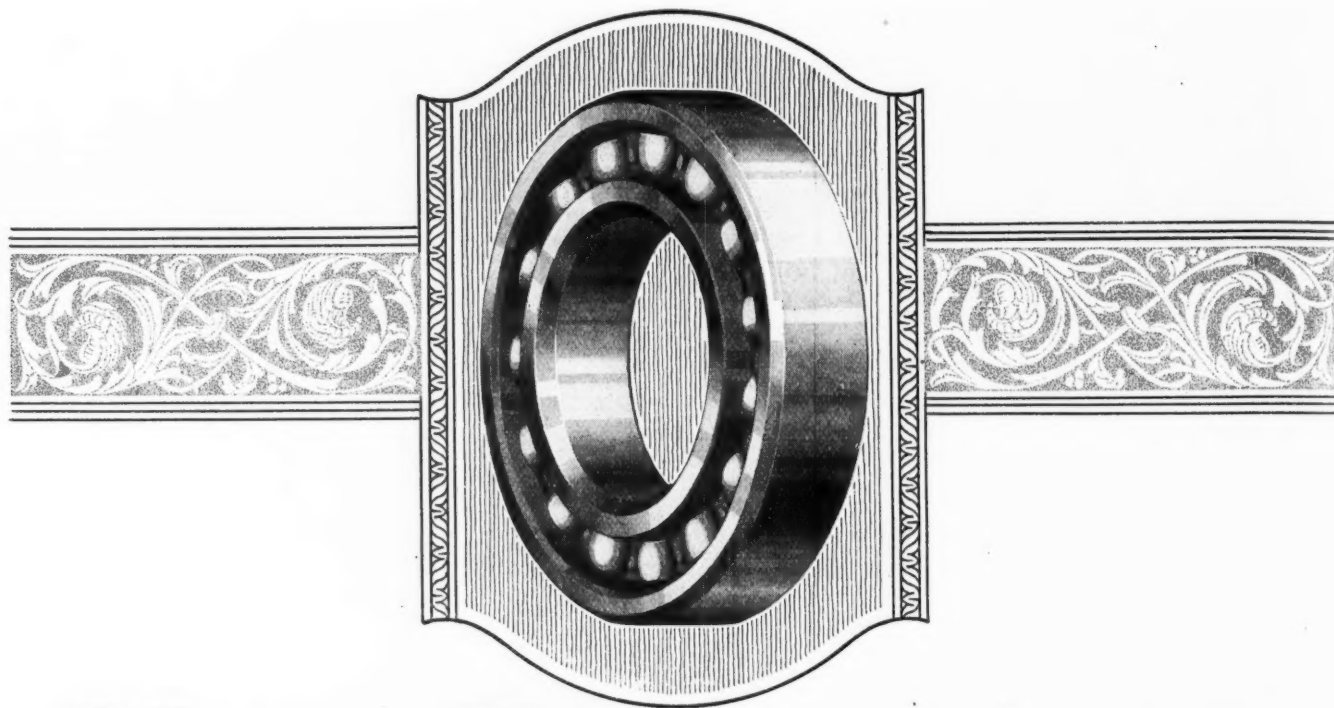
The Little Red Adjustment Wrench is furnished free with every set of Stewart Shock Absorbers

Stewart

CUSTOMBILT ACCESSORIES

USED ON 9 MILLION CARS

*Stewart-
Display in
Row at the
Automobile
to 12th 1924*



New Departure Ball Bearings

"By winning second place in the race at Beverly Hills, Thanksgiving, I am National Speedway Champion for 1923. *My car is fully equipped with New Departure ball bearings and has given me the finest of service.*"

Eddie Hearne



The Answer:

Lockheed Hydraulic Four-Wheel Brakes have been adopted as standard or optional equipment by the following manufacturers:—

Chalmers Peerless Collins Six Columbia Dusenbergs Eaton Axle Haynes
Kissel Paige Peerless Eight Stutz Timken Axle Wills Ste. Claire

It is inevitable, in our opinion, that all motor car manufacturers must ultimately adopt Lockheed Hydraulic Four-Wheel Brakes.

The superiority of the hydraulic principle—exclusive to Lockheed Four-Wheel Brakes and completely protected by patents—is so transparently clear and plain that a simple demonstration to any car owner is absolutely conclusive.

It is even more impressive to the automotive engineer, because all engineers and every student of engineering accept as axiomatic the basic principle upon which Lockheed Brakes are constructed.

That principle is the law laid down three hundred years ago by Pascal, the great Seventeenth Century physicist, which reads today as though it had been written with direct reference to Lockheed Hydraulic Four-Wheel Brakes.

"The pressure exerted upon any portion of a fluid enclosed in a vessel," said Pascal, "is transmitted undiminished equally to all surfaces."

Lockheed Hydraulic Four-Wheel Brakes operate in strict conformity with this law—exerting pressure upon a liquid compound, which pressure is transmitted *undiminished* and *equally* to every braking surface on the car.

With Lockheed Four-Wheel Brakes, there simply *must* be uniformity of pressure—or perfect

equalization—upon which depends certainty of action, because their principle is as direct and positive and infallible as gravity.

Until the perfection of the Lockheed Hydraulic Four-Wheel Brakes, many leading engineers hesitated to recommend four-wheel brakes for their cars.

Not because they question the need of four-wheel brakes—but because they were willing to

The pressure exerted upon any portion of a fluid enclosed in a vessel is transmitted undiminished equally to all surfaces.—Pascal

wait for a brake system sure to remain equalized and to function perfectly under all operating conditions.

Brakes on an automobile are a safety factor. Primarily the degree of their safety depends upon the degree of equalization.

The Lockheed hydraulic principle—by providing positive and perfect equalization under all conditions—completely eliminates all possible sources of trouble.

Lockheed hydraulic equalization is inherently automatic, absolute, perfect and positive. The un-

diminished, undeviating power of a fluid under pressure is transmitted equally to all surfaces.

Lockheed Hydraulic Four-Wheel Brakes need *no* lubrication, anywhere, at any time, from one year's end to the other. At long intervals, they require only one adjustment—at the brake bands themselves—which anyone can make.

There is nothing to rattle, or to work loose, or to require taking up. Nothing to interfere with equalization or safety. No pins, clevises, toggles or linkages. Nothing but four high-pressure tubes in the channel of the chassis frame, and four short pieces of flexible tubing to the brakes themselves.

Simpler and less complicated than even the ordinary two-wheel types.

Manufacturers recognize but one identity in four-wheel brakes. That identity is the Hydraulic Brake Company—backed by adequate capital, secure in its patent position.

The automobile public will understand the Lockheed advantages quite as definitely as do manufacturers—and will welcome Lockheed Hydraulic Four-Wheel Brakes as the only practical solution of driving and braking safety.

Hydraulic Brake Company
5833 Russell St. Detroit, Mich.

LOCKHEED 4 Wheel HYDRAULIC 1 Brakes



Perfect Merchandising that means profits



If you have turned down customers who wanted socket wrenches so long that they don't come to you any longer for them, the Snap-on Display Board will soon tell them you are ready for them now with the best line in the world. Dozens of your customers are ready today to buy Snap-ons—all they lack is a place to buy them. The logical place is your store.

Aside from their quality and reasonable price, the biggest feature of Snap-on Interchangeable Socket Wrenches is the perfect plan under which they are merchandised. They have been designed with a view to the widest range of adaptability possible, and that adaptability is made unmistakable by the Snap-on Selected Kit, the Snap-on Display Board, and the helpful "What Car Do You Drive?" Booklet, that has become so popular with dealers.

The Snap-on Display Board, mahogany finished and given free with an initial stock order, gets attention and displays to best advantage the range of Snap-on Units. The "What Car Do You Drive?" Booklet gives instantly the units required to make up selected Snap-on Kits for individual cars, with prices separately and for the full Kit. And the Kit Bag provides a compact, flat, permanent package for the purchaser. The whole program means more and bigger sales, quick turnover, all of which means profit for you. Write for full details today.

New York
Auto Show
28th F. A.
Armory
Space 119 Main Floor
Jan. 5 to 12

MOTOR TOOL SPECIALTY CO.
14 E. JACKSON BLVD., CHICAGO
SNAP-ON WRENCH CO., MANUFACTURERS
Milwaukee, Wisconsin

Chicago
Auto Show
Coliseum
Annex
Basement
Jan. 26-Feb. 2

DISTRIBUTING BRANCHES:
Chicago, 1919 Michigan Ave.
Philadelphia, 1511 Fairmount Ave.
Pittsburgh, 7232 Kelly St.
Kansas City, 1933 McGee St.
St. Louis, 2609 Washington Ave.
Minneapolis, 111 S. Tenth St.
Richmond, 519 W. Broad St.
Denver, 1515 Larimer St.
New York, 1776 Broadway.

Snap-on

INTERCHANGEABLE

Socket Wrenches

"The Greatest Service From the Fewest Tools"

DISTRIBUTING BRANCHES:
Los Angeles, 1341 S. Hope St.
San Francisco, 280 Goldengate Ave.
Portland, Ore., 106 13th St.
Indianapolis, 631 N. Illinois St.
Atlanta, 227 Spring St.
Dallas, 312 S. Ervay St.
Seattle, 910 E. Pike St.
Detroit, 4849 John R. St.

Over 100,000 Stromberg Carburetors and Hot Spots Sold!

A Carburetor sales record never before equalled—and made possible only by the fact that the STROMBERG CARBURETOR and HOT SPOT for Fords delivers more mileage—more power—than any other Carburetor offered. It makes possible quicker getaway—and much easier starting—four great essentials that every Ford owner is looking for.

Equip your Ford now—put on the new 1924 STROMBERG Model. Stop wasting gas—get more real enjoyment out of driving your Ford than you ever thought was possible.

See your nearest dealer—if he doesn't carry the famous Stromberg Carburetor for Fords, write us direct for free literature and further information.

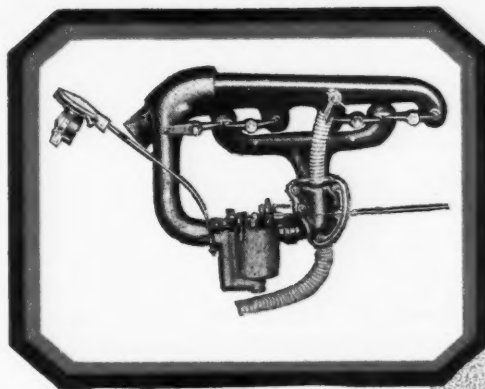
THE STROMBERG MOTOR
DEVICES CO.

Dept. 127

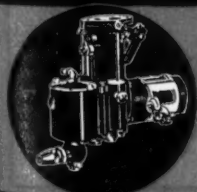
64 East 25th Street

Chicago, Ill.

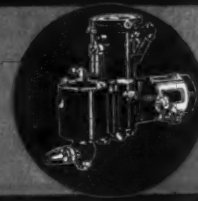
for Fords,

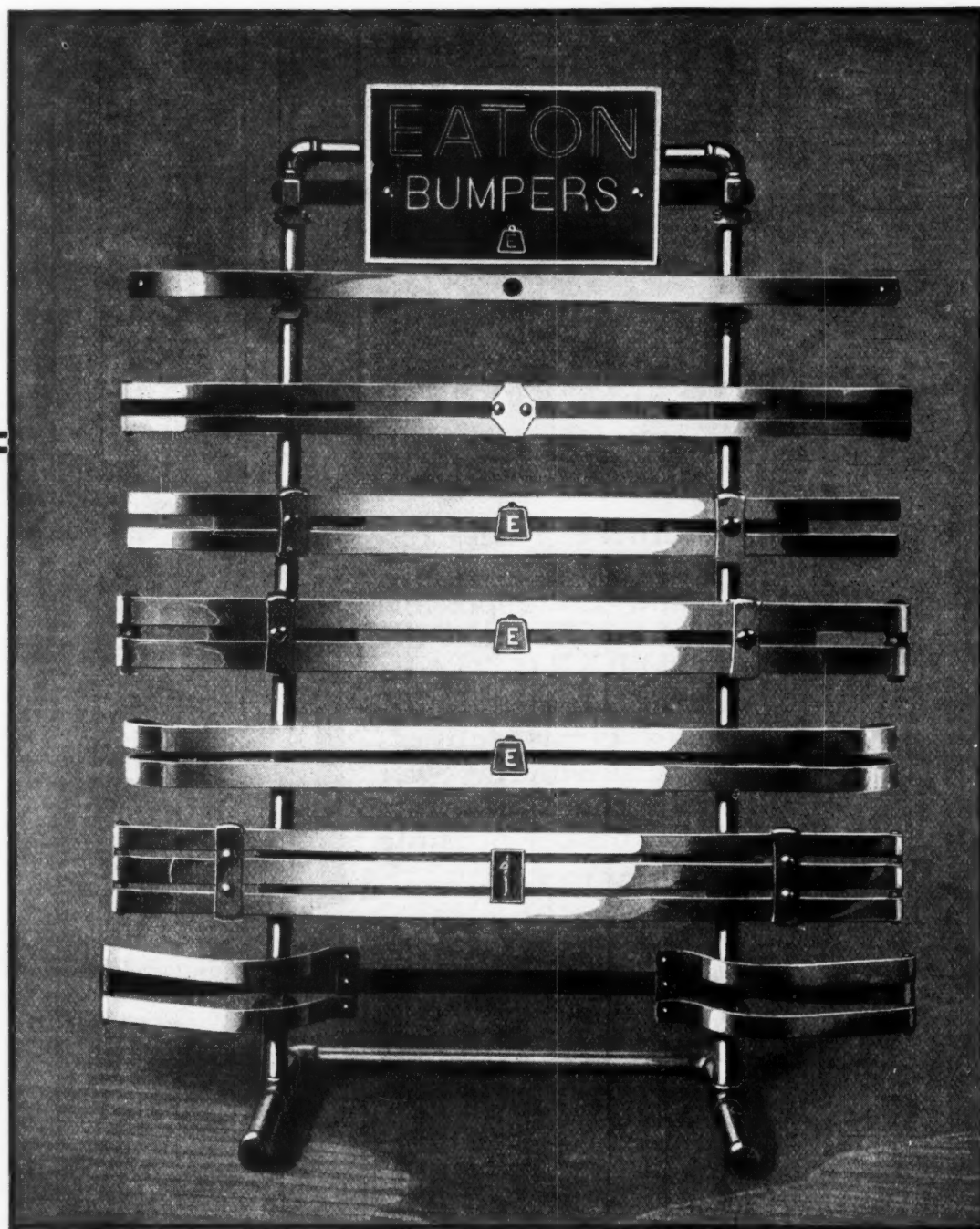


More than 135 Passenger Car and Truck Manufacturers use Stromberg as standard equipment.



New STROMBERG Does it!
CARBURETOR





THE bumpers for 1924 are EATON bumpers. Write for our new catalog and full details of our splendid proposition.

SHOW EXHIBITS
New York—Armory
Space 305-306

Chicago—Coliseum
Space 81-82

The EATON AXLE & SPRING COMPANY

CLEVELAND

EATON AXLES

PERFECTION SPRINGS

EATON BUMPERS

NEW YORK
1846 Broadway
PHILADELPHIA
223 N. 22nd Street

BOSTON
162 Brookline Ave.

ALBANY
N. Pearl and Van Woert Streets

CHICAGO
2637 S. Michigan Ave.
CLEVELAND
6515 Carnegie Ave.



The
Wasteful
Dripping
Nozzle~

10
Drops
a minute

from each dripping
nozzle, 200 gallons in
a year, in retail oil
sales means

\$200
LOST!

Wasteful Dripping Nozzles

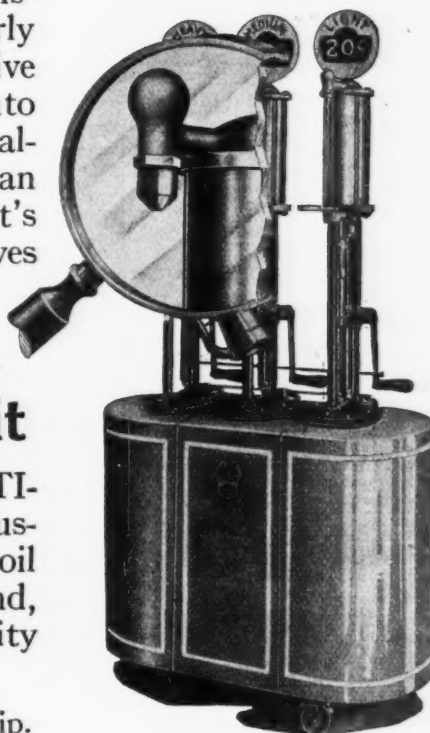
The Thieves of Your Oil Profits

Drip—Drip—Drip! Each oil dispensing nozzle you have is yearly wasting many gallons of expensive motor oil—oil that should go into your customers' cars. You can't salvage these drippings with a drip pan because of dust, sediment, etc.—it's a loss! Discard these profit thieves and install the

American Visible Lubricating Outfit

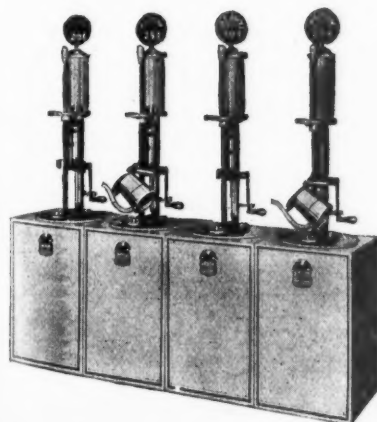
with the patented, exclusive ANTI-DRIP NOZZLE (see magnified illustration at right) that prevents oil profit losses. It serves clean oil, and, through force feed instead of gravity flow, serves oil quickly.

Make a check on your nozzles which drip. Count the drops per minute—figure the money you would receive if this *lost gallonage* was sold to your customers. The figures will astound you—enough in average cases to more than pay the cost of the American Visible Lubricating Outfit.



American Visible Lubricating Outfit

showing Anti-Drip Nozzle magnified. When turn of crank is stopped the flow of oil ceases instantly and there is *absolutely no dripping* from the nozzle.



Lubricating Outfit

with square tank in battery arrangement is particularly desirable where two or more tanks are placed side by side.

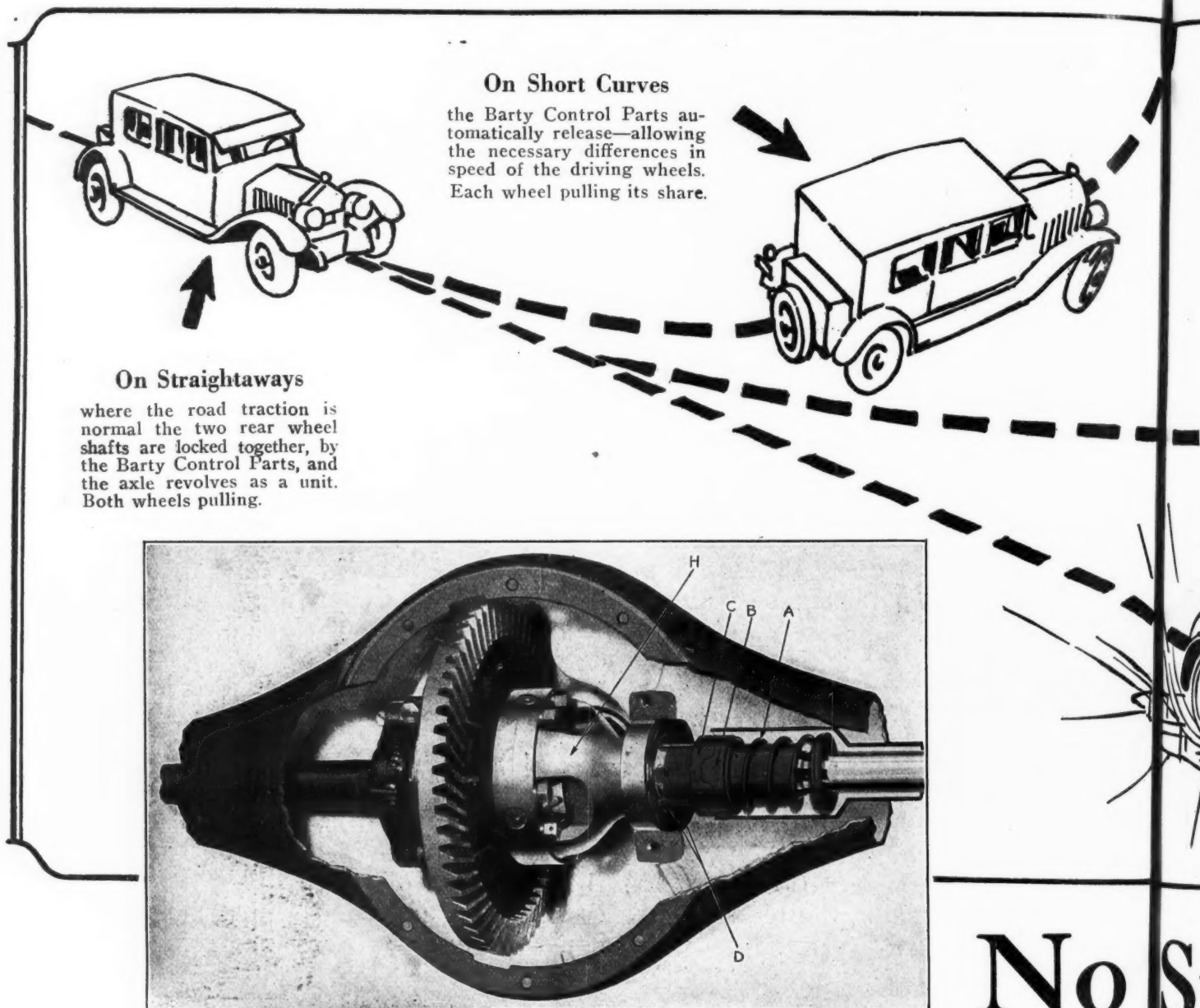
Stop These Oil Losses NOW!

Write us—let us give you more information on the savings to be made with this *modern* and *ideal* oil dispenser—the American Visible Lubricating Outfit. Write today!

**The American Oil Pump
& Tank Company**

1159 FINDLAY STREET,

CINCINNATI, OHIO



On Straightaways

where the road traction is normal the two rear wheel shafts are locked together, by the Barty Control Parts, and the axle revolves as a unit. Both wheels pulling.

On Short Curves

the Barty Control Parts automatically release—allowing the necessary differences in speed of the driving wheels. Each wheel pulling its share.

The Parts that make an Axle Perfect

Barty Control Parts automatically increase traction and brake action and prevent side slipping, stalling and skidding.

Engineers, Manufacturers of Cars and Trucks, Car Dealers and others interested are especially invited to see the Demonstration and display of Barty Control Parts at the New York Automobile Show, January 5 to 12, 1924, Space G-19 in the Balcony.

The Barty Control Parts installed on an axle act as a differential semi-lock.

This differential control consists of a jaw clutch with V Shaped teeth, which are normally held in engagement by a coil spring. Thus while the car is being driven over a straight course, the rear axle is virtually solid and the car will not lose its traction even if one of the wheels gets on slippery ground.

The Angles of the clutch

teeth are so proportioned that the clutch will not open until the torque on the parts becomes equal to one-half that required to slip a wheel on dry pavement.

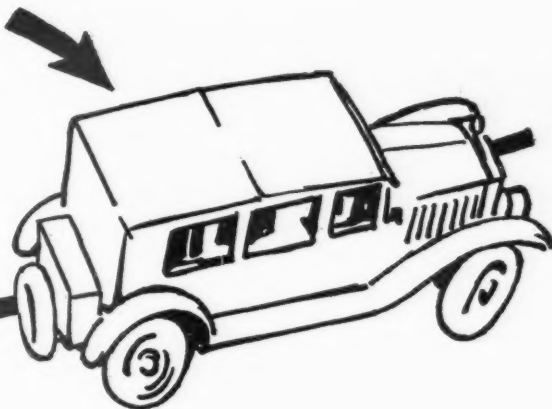
Turning a corner the torque instantly reaches that value and the clutch releases, allowing normal differential action.

The action of the Barty Control Parts is silent, smooth and vibrationless.

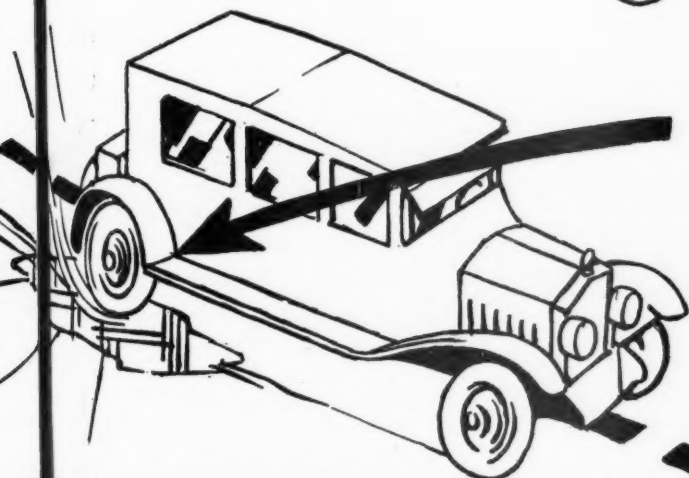
BARTY CONTROL PARTS

On Long Curves

where the curvature is only slight the rear axle revolves as a unit as on straightaways. No differential action necessary. Both wheels pulling.

**But it is on Slippery Roads or Pavements or in Mud Holes**

that the Barty Control Parts prove their greatest value. Under such conditions the Barty equipped axle operates as a solid axle and both wheels remain on the job. No spinning wheels.



Spinning Wheels!

THE differential equipped rear axle is a needed utility because, on sharp turns, it allows the necessary "difference of speed" in the two driving wheels. But on straightaways, particularly where the traction is bad or uneven, it is this very action of the differential that causes spinning wheels and lack of footing.

For such a condition the Solid Axle is better.

But by means of the Barty Control Parts an axle has all of the advantages of both types. It has differential action where such action is necessary and it is a solid axle where the equal speed of both wheels is to be desired.

A simple equipment involving only four parts which are easily and economically installed — the Barty Control Parts add very little to production costs and very much to driving utility.

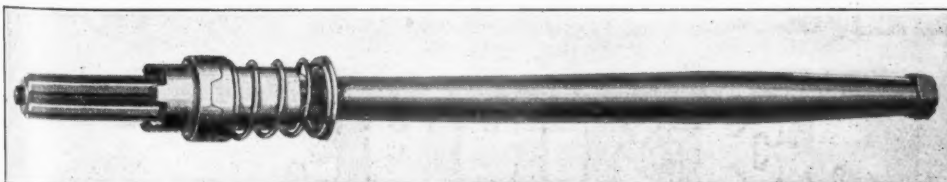
Ask for the complete details.

Barty Axle Corporation

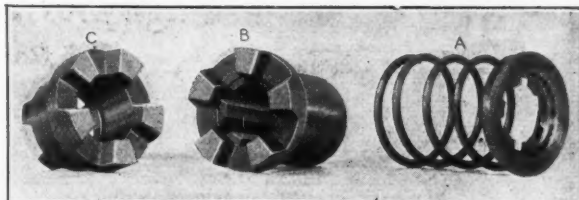
Syracuse, N. Y.

*Relative Size of Wheel
Shaft and Barty Control
Parts*

*Barty Control Parts and
Working Clutch Teeth*



PARTS



Alemite Announces

9,058

New Lubricating Stations

A unique comment on the American motoring public, reflecting as it does, the widespread awakening to the importance of lubrication

Nothing more commendatory of the American motoring public could be said than that during 1923 a total of 9,058 new Alemite Lubricating Stations were established throughout the country. (This does not include more than 25,000 automotive dealers handling Alemite Products).

These stations are all convenient places where the motorist can get complete lubricating service in minimum time at minimum cost.

The rapidity with which they have been springing up has been the sensation of the automotive world in 1923. But they have come only in answer to an insistent demand in every quarter for regular, periodic Alemite Lubrication.

This spectacular growth in the methodical use of Alemite is significant. It shows the motoring public is learning a great lesson in motor car upkeep. It shows, they too, have learned that Alemite chassis

lubrication is as fundamental in motor car operation as oil, water and air!

Repair men have long told us of the importance of correct and regular lubrication. They have pointed out that fully 80% of the repairs they make on the moving parts of a motor car are occasioned by nothing less than poor lubrication.

Automotive experts have ever urged that careful and methodical lubrication of chassis bearings is as important as lubrication of the engine. They have warned incessantly of dry, dirt-worn bearings as the major cause for big repair bills, rapid depreciation and low re-sale value.

Evidently, the public is becoming sensible to the importance of this matter of chassis lubrication. The springing up of Alemite Stations throughout the country as a result of the wide-spread demand for this high-pressure lubrication will make Alemite Service as convenient as gasoline and oil service.

THE BASSICK MANUFACTURING COMPANY

2662 N. Crawford Avenue, Chicago, Illinois

Canadian Factory: Alemite Products Co. of Canada, Ltd., Belleville, Ontario

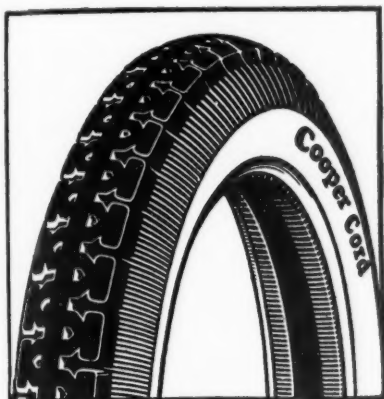
ALEMITE

High pressure lubricating system

A Bassick-Alemite Product

Keep the New Year New!

Make Each Month Show a Bigger Profit



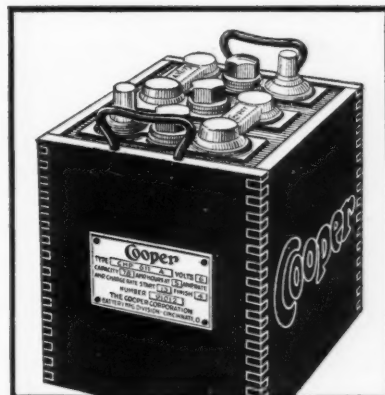
Cooper *Super-Size* CORD

The trim, perfect lines of Cooper Super-Size Cords cannot conceal the solid strength that the best materials and careful workmanship give them all. They are broad-shouldered and deep-chested, and they win the admiration of all who see them in your store.

The Cooper Dealer Plan, with its assurance of year 'round profits, can make this New Year the happiest one you've ever had, and keep it that way all year long. It will equip you to do business profitably and in steadily increasing volume, for twelve months in every year instead of six.

You need the Cooper Dealer Plan. It will free you from worry, give you a steady income, increase your prestige, and enable you to build a permanent business of far greater size than you can ever have if you stick to selling one seasonable article.

Start building that business right now. Turn over a new leaf and make the new year the biggest one you've ever had. Write us today for the Cooper Dealer Plan.



Cooper BATTERIES

Cooper Batteries are Cooper-made throughout. Their manufacture is entirely under Cooper control — an assurance of uniform quality that goes far in selling the consumer. Cooper Battery goodness is reflected in the pride you can take in selling them, and in freedom from almost all service expense.

THE COOPER CORPORATION
CINCINNATI, OHIO

Cooper Products

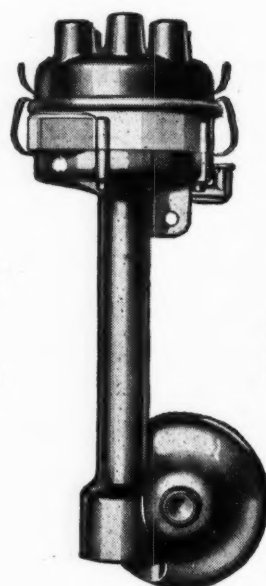
T I R E S • B A T T E R I E S

ATWATER KENT

Makers of
**THE WORLD'S HIGHEST GRADE IGNITION
STARTING AND LIGHTING**

THE millions of Ford Cars now in operation present to dealers a tremendous market for ATWATER KENT Ignition. The price to the owner is very attractive—the profit to the dealer is reasonable. Over 100,000 ATWATER KENT Ignition Systems are now in use on Ford Cars.

Literature to dealers on request



TYPE LA
for the
FORD

Price
\$10.80
*Including Cables
and Fittings*

ATWATER KENT MANUFACTURING COMPANY, PHILADELPHIA, PA.
4957 STENTON AVENUE

Hycoc

BRAKE LINING

*Folded and Stitched
Hydraulic Compressed*

MILLIONS
OF FEET
ANNUALLY

MILLIONS of feet of Hycoc Brake Lining have been installed as original equipment on automotive vehicles this year. Millions of feet more will be installed the coming year. There is a stronger demand for Hycoc every day.

Large auto manufacturers, investing hundreds of thousands of dollars in Hycoc Brake Lining, had to be *sold*, before they bought. Hycoc is *keeping* them *sold*. It means something to receive the unqualified approval of executives, purchasing agents, testing laboratories, engineers and service managers.

Take a tip from the manufacturers!

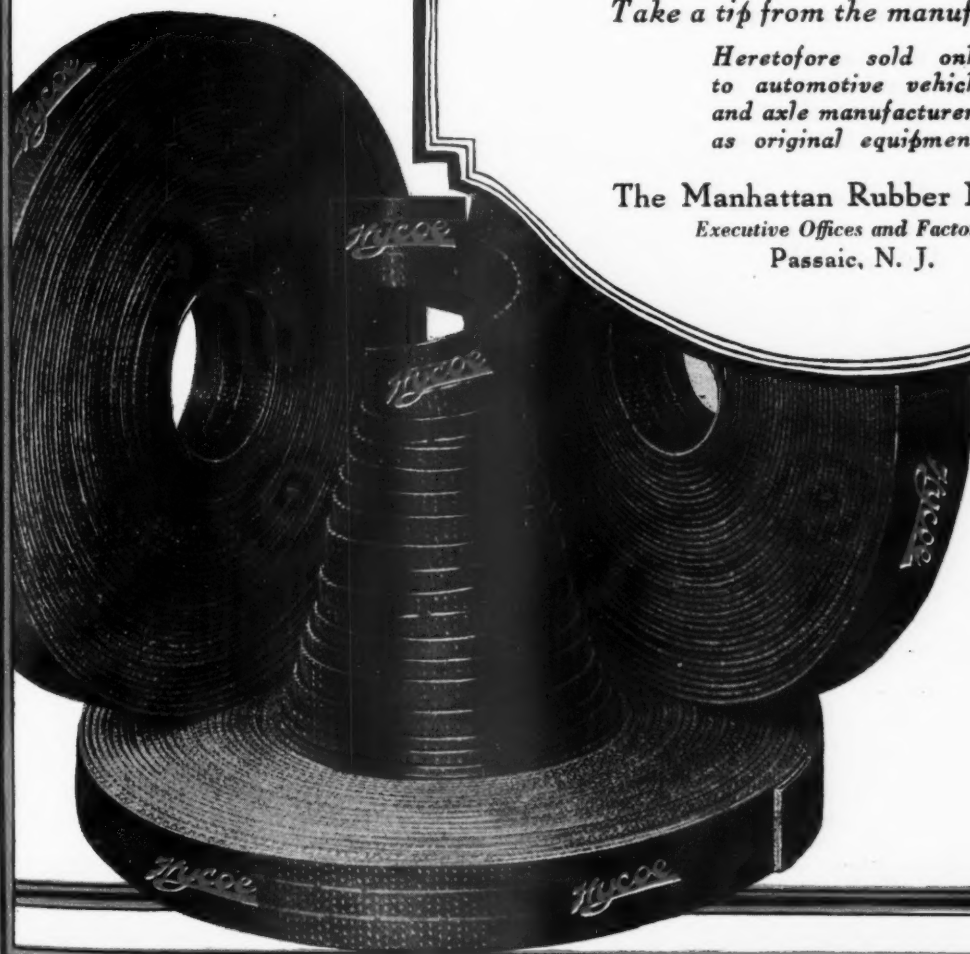
*Heretofore sold only
to automotive vehicle
and axle manufacturers
as original equipment.*

The Manhattan Rubber Mfg. Co.

Executive Offices and Factories
Passaic, N. J.

BRANCH OFFICES

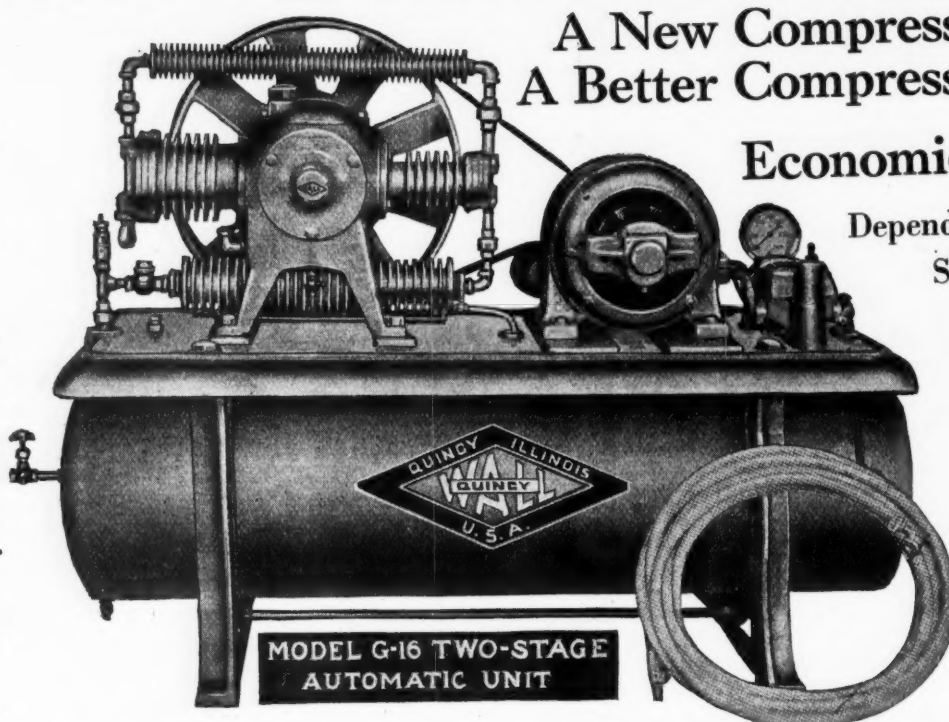
New York
Detroit
Minneapolis
New Orleans
Pittsburgh
St. Louis
Salt Lake City
Chicago
Baltimore
Birmingham
Boston
Columbus
Los Angeles
Tulsa



THE QUINCY SILENT AIR-MASTER

10 FACTS

- 1 Aluminum intercooler delivers cool air to high pressure cylinder.
- 2 Special finned aftercooler delivers cool air to tank.
- 3 Fan blade fly wheel, throwing unrestricted rush of air across each finned cylinder, intercooler and aftercooler assures cool dry air.
- 4 Connecting rod assembly, laminated shims for adjustments. This feature is found only in, THE QUINCY.
- 5 THE QUINCY excels all others in easy access to its working parts.
- 6 THE QUINCY'S tight, solid construction guarantees freedom from vibration.
- 7 Cylinders are bolted to crankcase, not integral, six cooling fins to each. Pistons are ground to size, rings turned.
- 8 The splash system assures proper lubrication, automatically lubricates all parts. No reciprocating parts touch oil.
- 9 The superior valve construction has many exclusive QUINCY features:
 - (a) Light weight saw blade steel discs, each weighing fraction of an ounce.
 - (b) The light weight, minimum lift, large bearing surface means long life. Indestructible.
 - (c) Spring actuated.
 - (d) Minimum lift, 1/32 inch. Ground to seat.
 - (e) Unrestricted air passages.
- 10 Large air volume at low cost. The fastest pumping compressors on the market.



A New Compressor
A Better Compressor
Economical
Dependable
Silent

TAKING OUT THE HEAT

Through a Better Cooling System

The aluminum intercooler—the cooler between the low pressure and high pressure cylinders—is made of aluminum, consisting of fifty-three fins. This intercooler, by virtue of its scientific design and material, has shown exceptionally high efficiency.

The aftercooler is a gray iron casting with thirty-two radiating fins which cool the air after the second stage and before delivering it to the receiver. This aftercooler embodies a special constructed separator which separates the moisture from the air permitting only dry air to enter the receiver. This moisture is automatically drained from the separator when the motor stops, and at the same time—pressure is relieved from the compressor so that the motor will have no load to work against when starting.

The entire cooling system on the Quincy Silent Air-Master was designed by our own engineer and has proven to be the most efficient cooling system in use on air cooled equipment, the air entering the receiver at practically atmospheric temperature.

Your special attention is called to our particular design of Fan Fly Wheel and its location, permitting a perfect distribution of air over the entire cooling system.

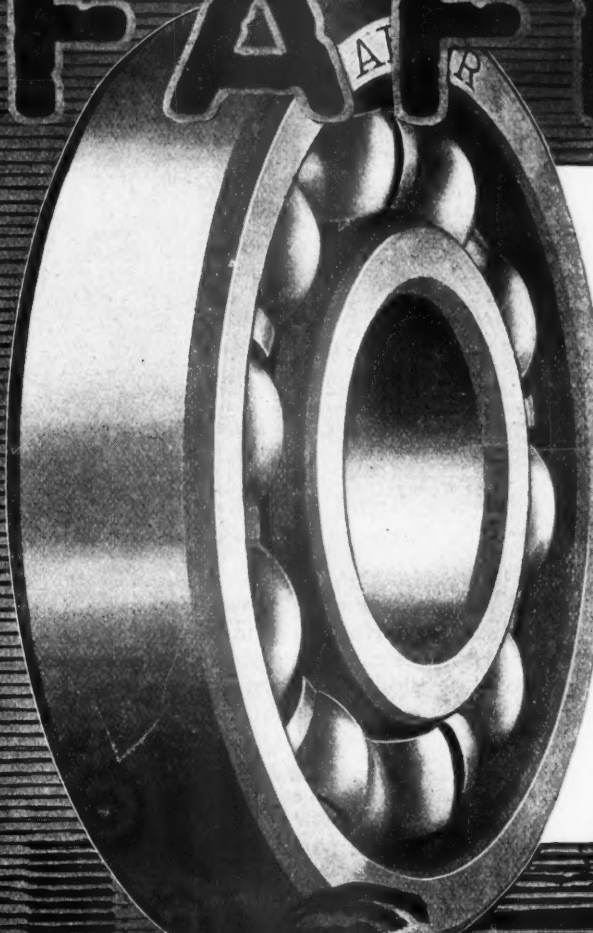
Write us today for catalog and price list.

Will exhibit in space A-42 at the Cleveland Auto Show, January 19th to 26th.

Will exhibit in space 35 at the Chicago Auto Show, January 26th to February 2nd.

The Wall Pump & Compressor Co.
217 Maine Street
Quincy, Ill., U. S. A.

FAFNIR



Everyone who realizes the vast number of revolutions made by the wheels, transmission and drive shafts for every mile of travel, gives serious consideration to the bearings when buying a car.

Fafnir Ball Bearings of all standard types and sizes are manufactured with the utmost accuracy and finish from thoroughly heat treated chrome alloy steel, virtually eliminating friction and without need for re-adjustment.

THE FAFNIR BEARING CO.

New Britain, Conn.

CHICAGO, ILL. 537 South Dearborn St.

DETROIT, MICH. 120 Madison Ave.

Room 511.

CLEVELAND, OHIO. 1016-1017 Sweetland Bldg.

NEW YORK, N. Y. 5 Columbus Circle.

NEWARK, N. J. 271 Central Ave.

PHILADELPHIA, PA. 1427 Fairmont Ave.





HEAT-SHAPED

to insure perfect roundness

Pedrick Piston Rings are Heat-Shaped in the Furnace to a "Perfect Round."

THE Heat-Shaping is the LAST step in the manufacture of a Pedrick ring, and in addition to insuring perfect roundness, the furnace treatment removes all of the internal stresses, which are always developed by casting, cutting, machining, and grinding, and sets the ring to a definite radial pressure.

This result can be obtained in no other way and at no other time in the process of manufacture. Pedrick Heat-Shaped rings are the only rings made in this manner.

The finished Pedrick Heat-Shaped ring is perfectly round, stays perfectly round under all operating conditions, and always exerts the same constant pressure against the walls of the cylinder. The wear on cylinder and ring is uniform at every point, and with uniform wear, piston leakage and blow-by cannot develop.

The cost? Priced on a big production basis, Pedrick Heat-Shaped rings are sold at almost the price of a snap ring!

The distinctive Pedrick Heat-Shaped Oil ring is sold at the same price!

Write for the complete list of sizes and discounts.

WILKENING MANUFACTURING COMPANY
15th and Mt. Vernon Sts. Philadelphia, Pa.

Pedrick

HEAT SHAPED
PISTON RINGS



Model "A"
List Price \$7.50

Model "B"
List Price \$3.00

Your visor servicing is over!

"Buffalo" **Visors**

Do not crack, rattle or warp

because of their rigid, one-piece, rustproof, steel construction. They stay sold. Their handsome appearance enhances the value of any car. Aluminum trim, restful green underside, and eggshell gloss black enamel on top help show up real built-in quality.

Rapid sales increase for over a year, reported by many dealers (without sales helps) will be sped up by vigorous direct mail and periodical advertising campaign already started.

We want you to cash in on this so write or better **WIRE NOW** for sample and full details to Dept. No. 14-D.



Buffalo Forge Company
Buffalo, N.Y.

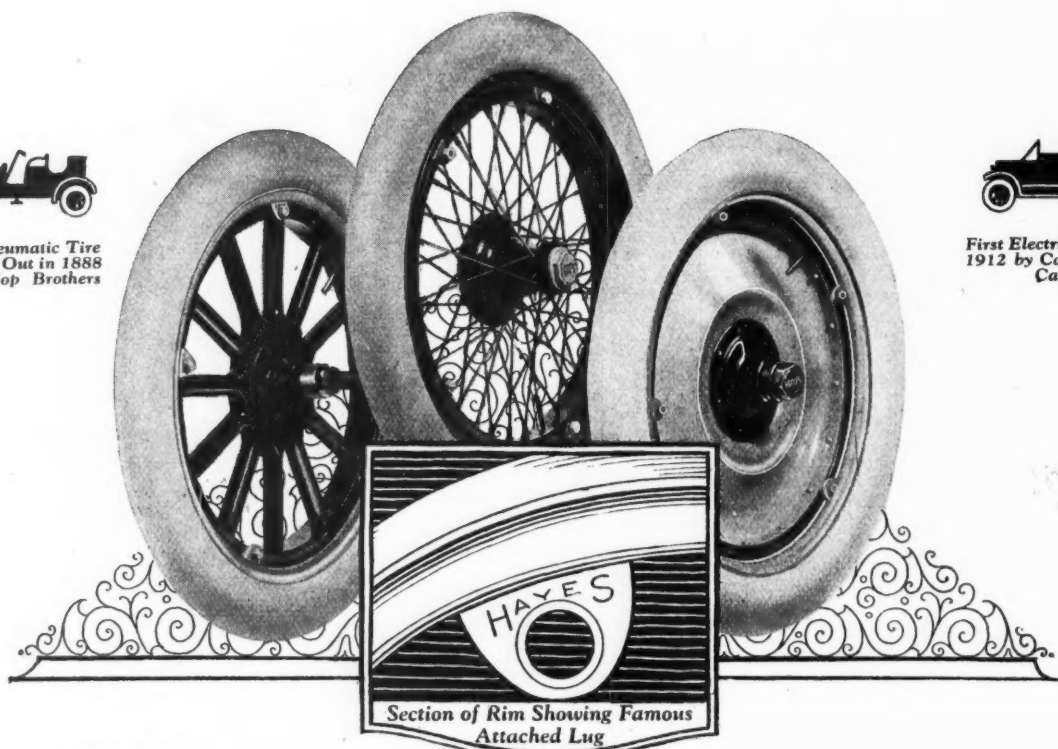
Look for Buffalo in Red on Underside of Visor



First Pneumatic Tire
Brought Out in 1888
by Dunlop Brothers



First Electric Self-Starter
1912 by Cadillac Motor
Car Co.



NOW—the third great event in motoring— Hayes Wheels—standardized in wood, wire and disc—with famous Attached Lug-Rims

No longer are automotive wheels regarded under one general classification. Motorists have always one sure guide with which to distinguish an unusually superior product—it is the name "Hayes." Since the very earliest days of motoring this name has been inseparably associated with the very best to be obtained in automotive wheels.

Now, with the rich fund of experience gained in the manufacture of more than 30,000,000 motor wheels; with manufacturing facilities unexcelled; Hayes again demonstrates that vitalizing force which distinguishes the true leader, by offering a line of standardized motor wheels in wood, wire and disc.

Moreover, all Hayes wheels are possessed of certain features which in point of convenience and interchangeability herald an event of unparalleled importance.

The Hayes Attached-Lug-Rim, unlike any other,

makes of each lug a driving member, instead of the usual practice of concentrating the strain at but one point in the circumference of the wheel. This distribution of strain means greater safety. When the Hayes Attached-Lug-Rim is drawn in place it is in perfect alignment.

Then, Hayes wheels all being standardized, rims, wheels and wheel parts, are instantly interchangeable. Wheel changes from wood to wire or disc are made as easily as changing a tire. Tire changes become a matter of moments.

So, with one great forward stride Hayes has swept aside all precedent and introduced a line of standardized wheels; all having the attached-lug-rim; all stamped with a makers' mark, which marks a superior product.

Look for the name "Hayes" on the lug. Over fifty per cent of all motor cars are equipped with Hayes wheels. Request them on your next car.

HAYES WHEEL COMPANY, Manufacturers, Jackson, Michigan

Factories: Jackson, Albion, Flint, St. Johns, Michigan; Anderson, Ind., and Nashville, Tenn. Canadian Plant: Hayes Wheel Company, Ltd., of Canada; Factories at Chatham and Merriton, Ontario

HAYES WHEELS

WITH ATTACHED LUG RIMS—STANDARDIZED IN WOOD, WIRE AND DISC



Presenting- AMERICA'S *MOST EXCLUSIVE* QUALITY CAR

Seven new body styles
Strikingly new color combinations
127-inch wheel base

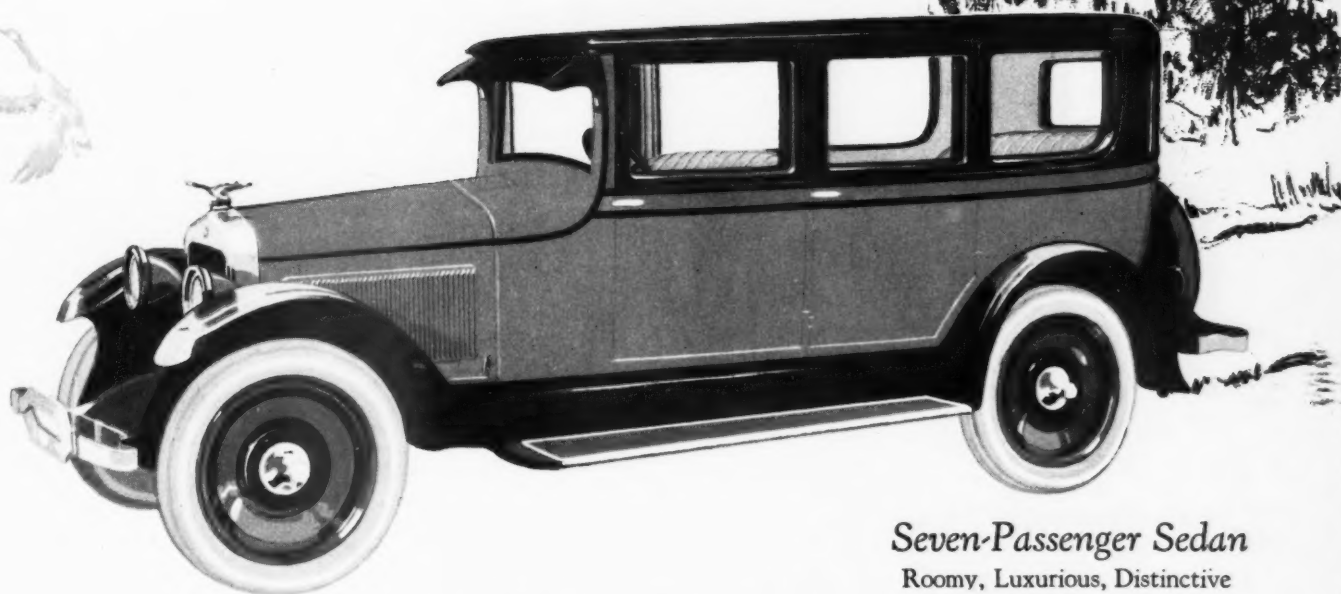
Famous Wills Saint Claire Power
Plant refined and improved

Mo-lyb-den-um steel

Hydraulic Four-Wheel Brakes
(Under Lockheed Patents)

Large Balloon Tires

Prices \$2875 to \$3800



Seven-Passenger Sedan
Roomy, Luxurious, Distinctive

The New and Larger WILLS SAINTE CLAIRE

NEW YORK SHOW
SPACE 10



© W. S. C. Inc.

CHICAGO SHOW
SPACE 4

The New and Larger

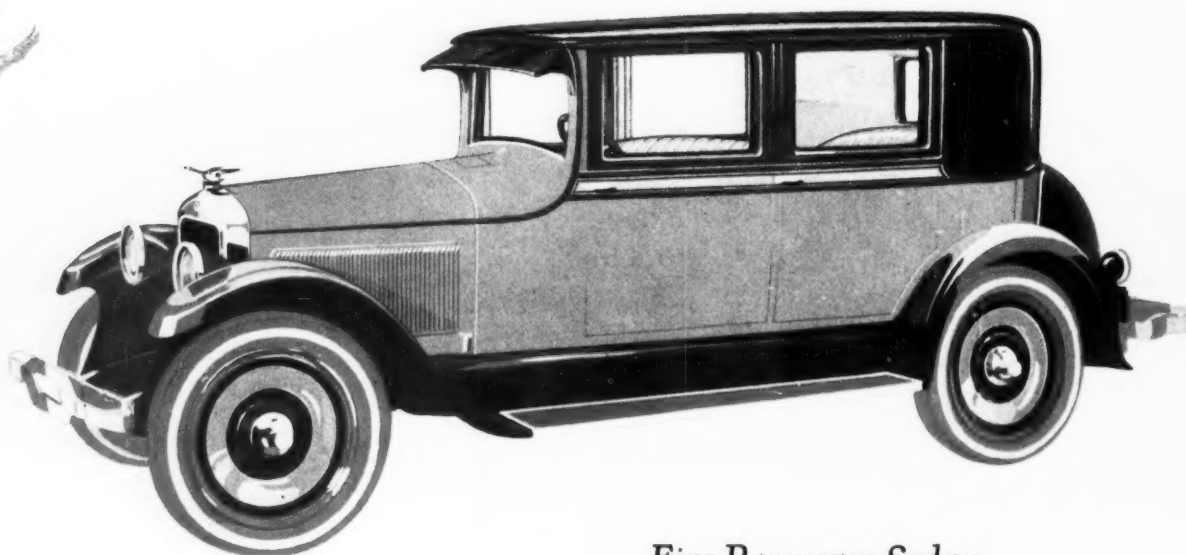
THE CHARM of exclusive individuality marks these new Wills Sainte Claire models. The line is complete. Every transportation requirement is met. Wills Sainte Claire leadership is again demonstrated.



Four-Door Brougham

A Car of Individuality and Character

IN PURE beauty of design and finish the new Wills Sainte Claire stands supreme among fine motor cars. The low graceful sweep of its lines, the striking individuality of its color combinations, the rich luxury of its upholstery, and the dignified fineness of its interior equipment give it an atmosphere of exclusive quality that commands the instant approval of discriminating motorists. It is America's most distinguished car.



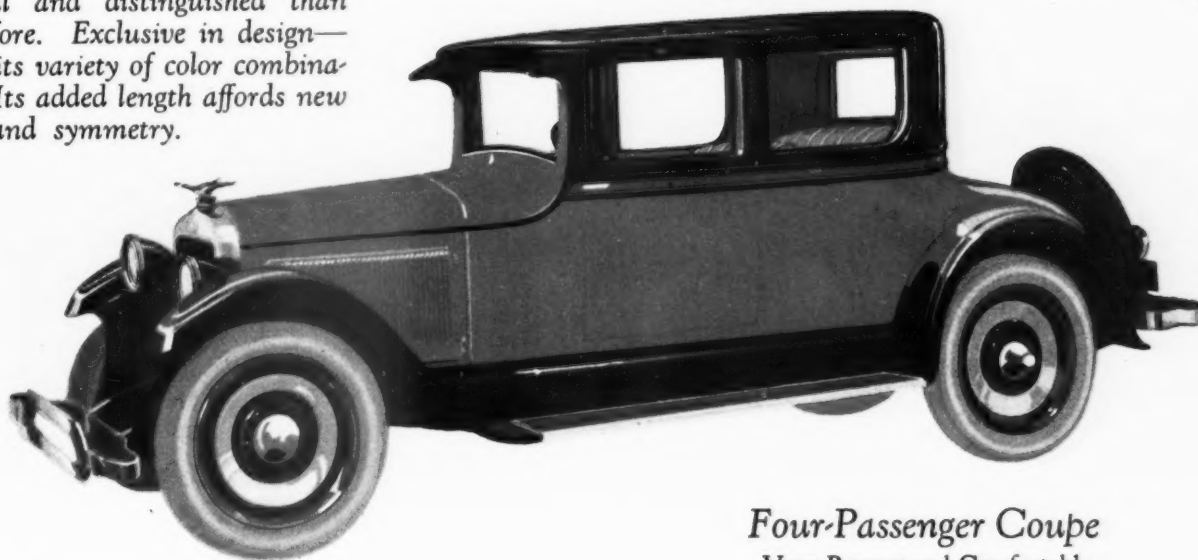
Five-Passenger Sedan

Note the low Graceful Sweep of its lines
—There is Personality and Dignity to it—



WILLS SAINTE CLAIRE

ALWAYS noted as a car of graceful and harmonious lines, Wills Sainte Claire is this year more beautiful and distinguished than ever before. Exclusive in design—rich in its variety of color combinations. Its added length affords new sweep and symmetry.



Four-Passenger Coupe
Very Roomy and Comfortable

EVEN Wills Sainte Claire owners accustomed to the superb performance of Wills Sainte Claire cars are amazed at the eagerness and power of these new models.

The new firing order gives to the motor increased power and a marvelous smoothness of action. The new carburetor and pre-heating device insure still further efficiency. The new clutch adds wonderfully to the smooth, velvety transmission of power. New and larger bullet lamps afford the most perfect illumination ever developed for motor car use.

Every detail is complete—the new Wills Sainte Claire is an *Automobile* all the way through.



Seven-Passenger Phaeton
Affording Maximum Passenger Capacity



The New and Larger WILLS SAINTE CLAIRE

THIS wonderful new Wills Sainte Claire line offers to dependable dealers an opportunity as rare as it is attractive.



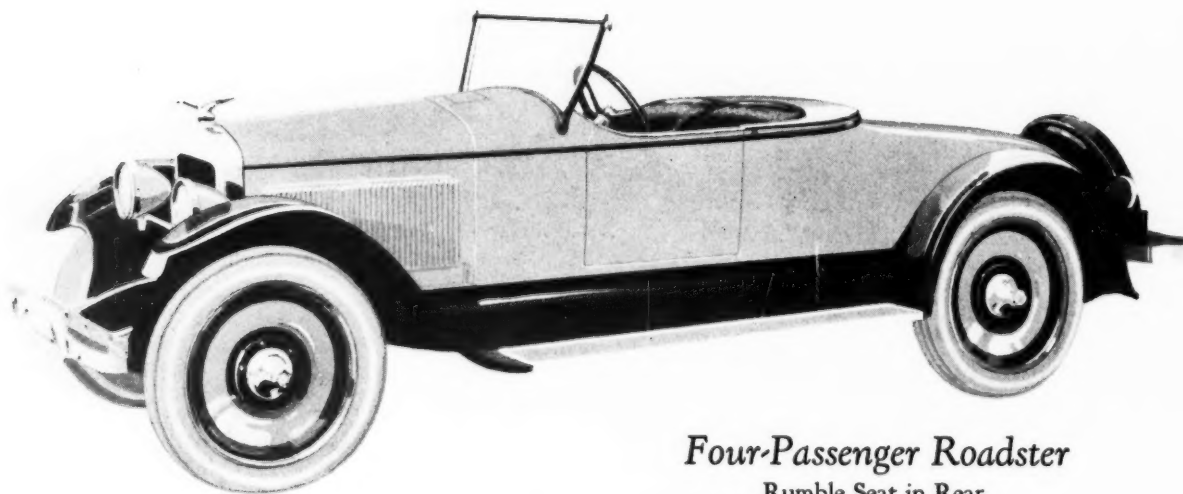
Gray Goose Special

Rich Spanish Leather Upholstery Harmonizes
with Exterior Finish

EXPANSION of Wills Sainte Claire production, along lines laid down three years ago by C. Harold Wills, enables this Company to enter during 1924 many cities and towns that it has heretofore been unable to serve.

This means an exceptional opportunity for dealers of sufficient responsibility and experience to handle this fine motor car.

The new models will be on view at New York, Chicago and other important automobile shows—and at the showrooms of Wills Sainte Claire distributors. Be sure to see them. Write for further details.



Four-Passenger Roadster

Rumble Seat in Rear
Removable Cape Top

WILLS SAINTE CLAIRE, INC.

500 East Jefferson Avenue
Detroit

NEW YORK SHOW - SPACE 10

Factory at Marysville,
Michigan

CHICAGO SHOW - SPACE 4



© W. S. C. Inc.

The Big Show in a Bigger Place

24th Annual National

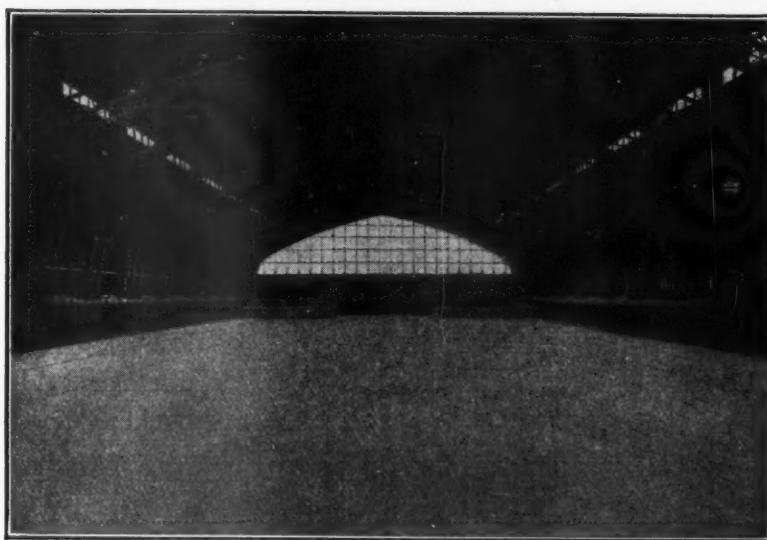
AUTO SHOW

NEW YORK

JAN. 5 to 12

Auspices National Automobile Chamber of Commerce Inc.
S.A. MILES Manager, 366 Madison Ave. N.Y. City.

No
Pillars
No
Elevators
No
Stairs
A
Spacious
Restaurant



From your
Hotel to
Your
Display
Space
Entirely
Under
Cover

The Armory—180,000 square feet without a post.

It Will be More to Your Advantage to Visit the New York Automobile Show This Year Than Ever Before

THE National Automobile Show in the 258th Field Artillery (formerly the 8th Coast) Armory, will mark the first time since the industry assumed a position of leadership that the stage for the annual exposition has been in keeping with the vastness of the industry.

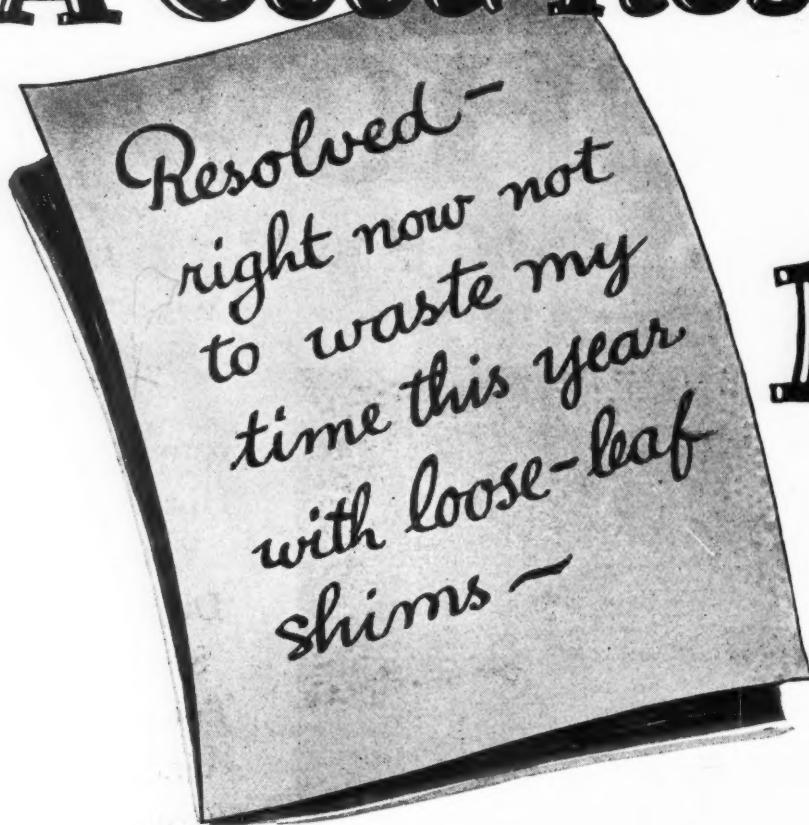
The Armory is ideally situated

for the convenience of the public, being reached directly by Subway, Elevated and trolley lines. It is only 30 minutes from the down-town hotel section by Subway. There are balcony seats for 2,000 persons, a spacious restaurant and every other desirable convenience.

Chicago Nat'l Show - Coliseum and Armory - Jan. 26 to Feb. 2

The Big Show in a Bigger Place

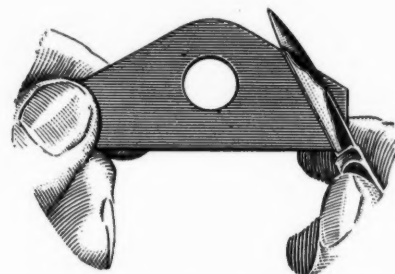
A Good Resolution for 1924



THE WISE SERVICEMAN uses LAMINUM — the shim that PEELS. He saves just half his time; the job is *accurate*; there's no wasted labor or lost motion. This year, use LAMINATED SHIMS and put the added profits in your pocket.



Here's a bunch of time-wasters. They wrinkle and get full of dirt. Who wants to bother with a lot of loose leaves?



And this is the greatest little time-saver in the industry. All you need is a penknife and peel 'em down to fit.

You can get a LAMINATED SHIM for every make of car. The line is complete. From *all* jobbers. Write us for a SAMPLE SHIM and request Replacement List and Data Sheets.

Address "Sales Dept."

LAMINATED SHIM COMPANY, INC.

14th St. & Governor Pl., Long Island City, N. Y.

St. Louis, Mazura Mfg. Co.



LAMINUM

Gabriel Snubbers Complete Car Owner's Satisfaction

Keeping the owner sold on the car he buys is the foundation of a bigger business and greater profits.

Gabriel Snubbers accomplish much in giving car owners a degree of riding satisfaction which makes them boosters for you and the car you sell.

Violent road shocks are unknown to a car equipped with Gabriel Snubbers. Smooth, easy riding is enjoyed by both the driver and passengers.

Equally important, servicing is **less**. Many minor, but troublesome and expensive adjustments caused by excessive vibration, are eliminated.

Thousands of dealers have recognized the soundness of recommending the installation of Gabriel Snubbers. A great many install them on practically every car they sell.

Get in touch with the Gabriel distributor in your locality or write us direct and learn how you can make gratifying profits by installing Gabriels and also enjoy the asset of more satisfied customers.

The new 1924 Gabriel Sales Plan is ready. Write for your copy.

GABRIEL MANUFACTURING COMPANY

1415 East 40th Street • Cleveland, Ohio

Gabriel Manufacturing Co. of Canada, Toronto, Ont.

~ Sales & Service Everywhere ~



**GABRIEL
SNUBBERS**

Gabriel

**Greater
Riding
Comfort**

Snubbers

Harvey

RACINE

Announces Further Developments in a Sales and Service plan that will prove of interest to dealers who are the Leaders in their Communities

Harvey National Advertising for 1924 will reach more than 17,000,000 people a month. It will teach them to look for the Harvey Service Sign when they need springs. That means sales and profits for the Dealer.

1924 will be a big year for dealers who are now Harvey dealers and for those who will become Harvey dealers. The Harvey Plan for 1924 holds forth unusual profit possibilities. With a product of the highest quality for its foundation—Harvey "Easy Riding" Springs and Harvey "Ride Rites"—the Shock-absorbing Spring—it is backed up by a Jobber and Dealer policy that insures the utmost turnover on the smallest possible investment. This in turn is reinforced by the most intensive advertising ever put behind any line of springs. The Harvey franchise is a sure winner for the dealer.

The Harvey Turnover Policy assures Jobbers and Dealers that every spring in their stock is alive. No Dealer is ever 'loaded up' on Harveys. Harvey Dealer Helps attract new patrons to your store, bring them in ready to buy and increase your sales opportunities. Harvey cooperation is complete.

Write for full information. Dept. F.

*(Correct Spring Design
(Shock-absorbing qualities built in)
attains its highest development
in Harvey RIDE-RITE Springs)*

Harvey Spring & Forging Co., Racine, Wis.





Harvey

RACINE

Advertising

Reaches over 17,000,000 every month

Motorists know about Harvey Springs and Harvey Service. They know that the Harvey sign stands for better springs, quicker service. Harvey advertising has taught them. Every month more than 17,000,000 read the Harvey message in The Saturday Evening Post, The Country Gentleman, Collier's and Motor Life. When they need springs they go to the Harvey Dealer. They know where he is. The Harvey Sign, the Harvey Window Poster, and other Harvey Dealer Helps has shown them.

The Harvey Sales Plan is based on the fact that only the sales made over the Dealer's counter really count. That's the reason Harvey Advertising, Harvey Sales Helps, Harvey Service and the Harvey Turnover Policy all have the one definite aim — bigger Dealer profits through more Dealer sales and faster Dealer turnover.

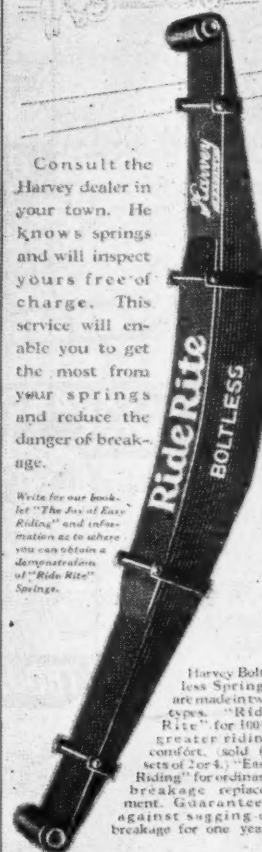
(Correct Spring Design)
(Shock-absorbing qualities built in)
attains its highest development
in Harvey RIDE-RITE Springs

Harvey Dealers
**know
Springs**
Let them inspect yours
Free of Charge



Consult the Harvey dealer in your town. He knows springs and will inspect yours free of charge. This service will enable you to get the most from your springs and reduce the danger of breakage.

Write for our book, let "The Joy of Easy Riding" and information as to where you can obtain a demonstration of "Ride Rite" Springs.



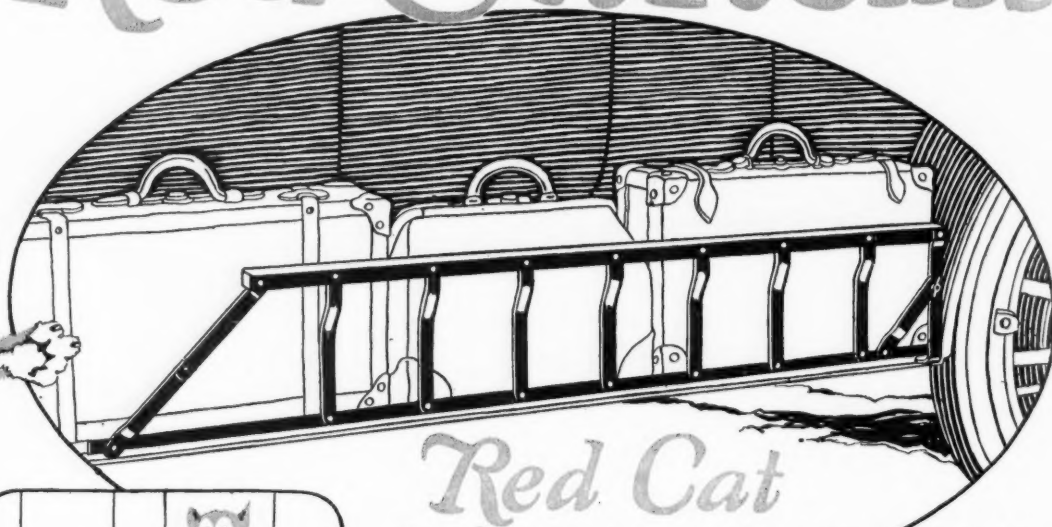
Harvey Boltless Springs are made in two types, "Ride Rite" for 100% greater riding comfort, sold in sets of 2 or 4; "Easy Riding" for ordinary breakage replacement. Guaranteed against sagging or breakage for one year.

Dealers: Write us for complete information on the Harvey Plan of Free Spring Inspection. Make your place of business "Spring Headquarters".

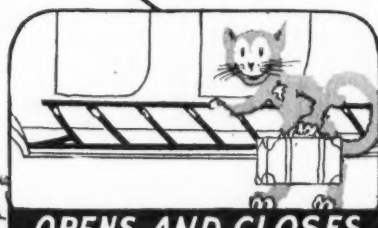
Harvey Spring & Forging Company
Dept. 6
Racine, Wisconsin

Harvey Spring & Forging Co., Racine, Wis.

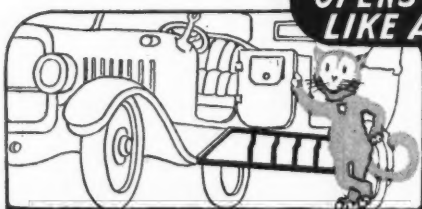
Two Red Cat Items



Red Cat DELUXE CARRIER



**OPENS AND CLOSSES
LIKE A JACK KNIFE**



**AMPLE CLEARANCE TO
OPEN DOORS**



THOUSANDS BEING SOLD

The invisible luggage carrier. Folds flush with the running board. Opens easily and brace snaps rigidly in place. Carries a big load snugly and safely. Motorists find hundreds of handy uses for it, for traveling luggage, hunting, fishing and golf things, etc. And when the user is through with it it is folded out of sight and out of the way.

Red Cat DeLuxe Carrier will make you quick sales and substantial profits all year. Get full information from your jobber or write us.

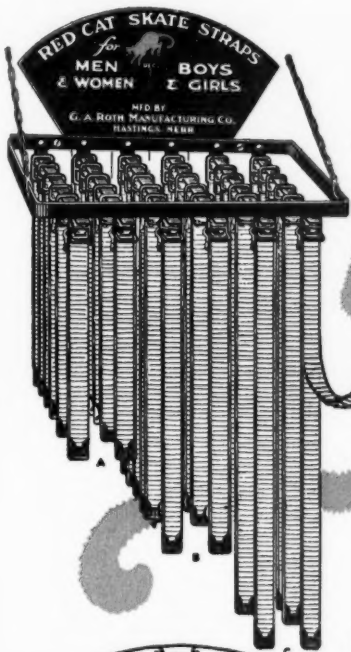
TWO SIZES: \$5.00 and \$6.00

G. A. ROTH MFG. CO.

HASTINGS, NEBR.

Red

that Ring Cash Registers



Get this Handy Auto Strap Merchandiser

The handiest way ever devised for merchandising auto straps. A reminder for every customer who enters your store. Free with an order of Red Cat Auto Straps.

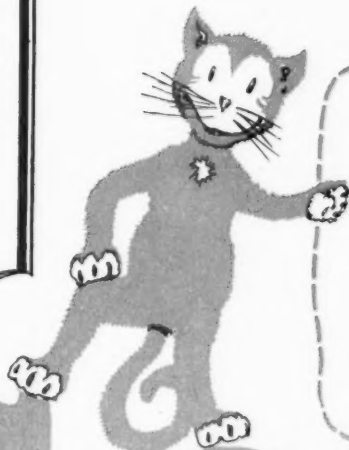
There is a year around demand for Red Cat Straps. Hundreds of handy uses. They are high grade straps with good selling features. Made of stoutest khaki belting, handy buckle with firm grip but easy to loosen, metal tip.

Other Red Cat Products

Red Cat Heaters for Ford, Chevrolet and Dodge.

Red Cat Valve and Push Rod Cover for Chevrolet.

Red Cat Fender Brace
Red Cat Luggage Carrier (Expanding Type)



Red Cat Products are handled by hundreds of Jobbers, but if yours does not handle them, don't let that worry you. Just send us your name and address and we will send you full information, prices, discounts, etc. The Red Cat line is worth investigating. It is a profit maker.

Name

Address

MAIL TO G. A. ROTH MFG. CO.
Hastings, Nebr.

Cat

Refuting an Ancient Roman Adage

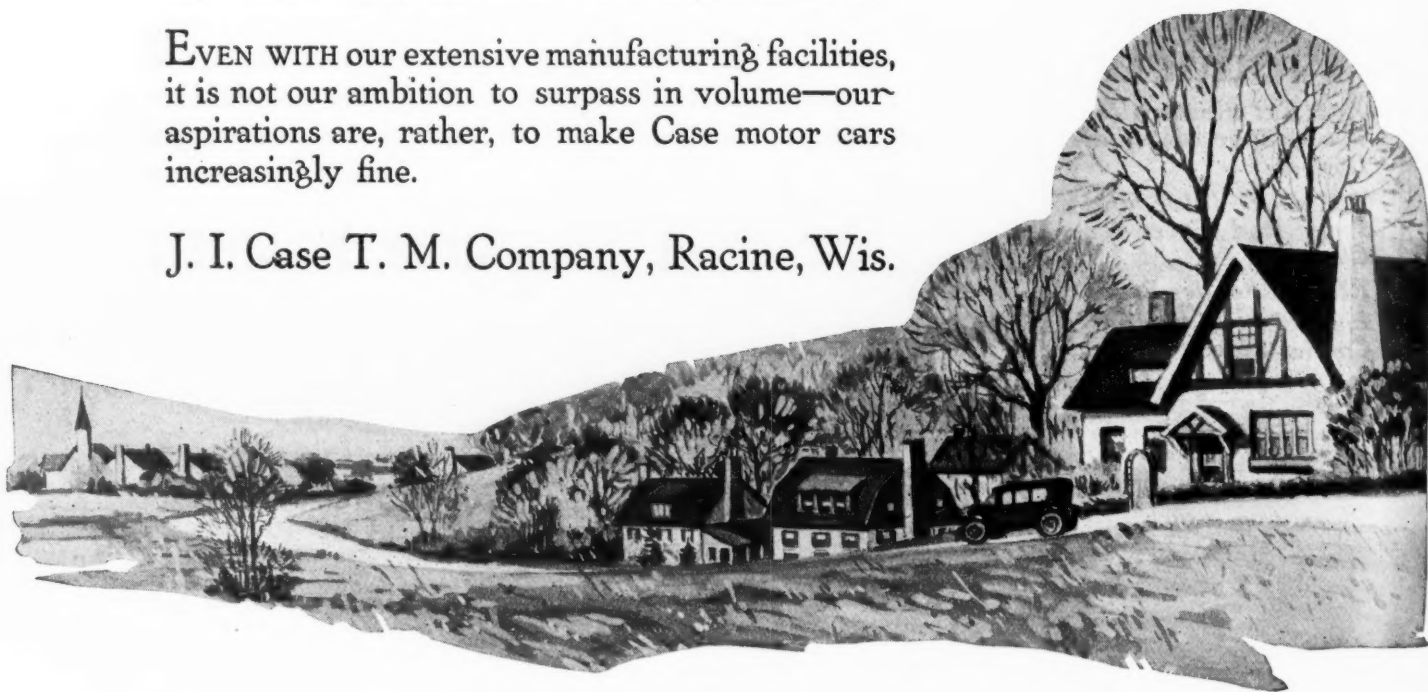
Familiarity Breeds Contempt
PLUBIUS SYRUS -Maxims

SOME MAY ASSUME that during the testing passage of years, our initial ardor of purpose might be somewhat cooled by the familiarity born of accustomed tasks.

IN REFUTATION of an age-old proverb, our many years of earnest endeavor and familiarity with our chosen work, has in no way altered our feeling of responsibility for that work or lessened our ambition of still higher achievements. The enthusiastic acclaim of thousands of friends has served only to intensify our efforts and heighten our ideals. Consistent with the policies that have always guided us, each Case motor car is built today as though the reputation of this eighty-two year old institution depended on the performance of that particular car.

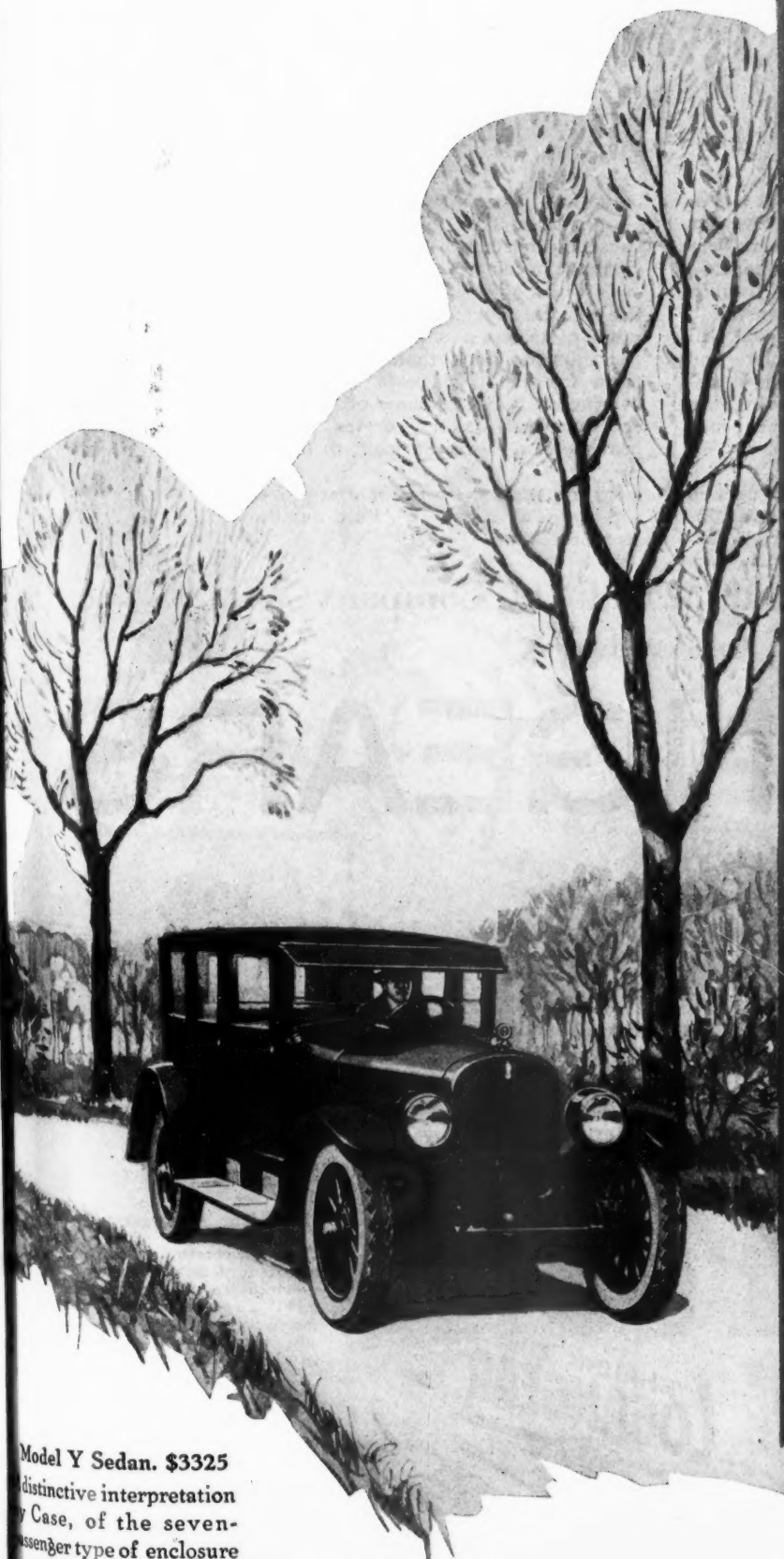
EVEN WITH our extensive manufacturing facilities, it is not our ambition to surpass in volume—our aspirations are, rather, to make Case motor cars increasingly fine.

J. I. Case T. M. Company, Racine, Wis.

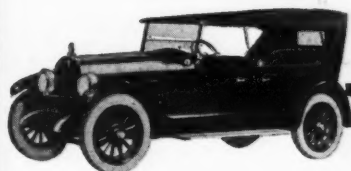


CASE

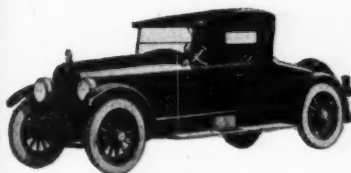
MOTOR CARS



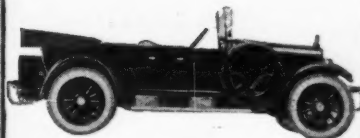
Model Y Sedan. \$3325
Distinctive interpretation
Case, of the seven-
passenger type of enclosure



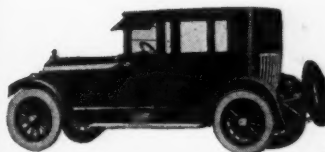
Model X Touring
\$1790



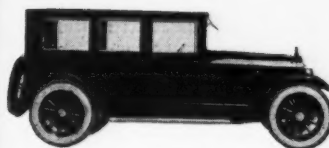
Model X Roadster
\$1750



Jay-Eye-See Sport Car
\$2230



Model X Suburban Coupe
\$2480



Model X Sedan
\$2575

On the Winter Overhaul Job— look for Battered Flywheel Teeth!

When you have a car down for a general repair job, be sure to give the starter gear teeth the once-over. Very often you will find them damaged—just about ready to give trouble. That's the logical time to install a Logangear. By so doing you will make the overhaul job complete and more profitable and boost your standing with your customer by saving him further trouble and the extra expense of tearing the car down again.

The job of installing Logangears is simple—any shop with modest equipment can do it. It is also very profit-

able and satisfactory. It entirely eliminates starter gear troubles because the hardened steel teeth of the Logangear can never batter nor strip.

We pass this advice along to the thousands of dealers now handling Logangears in the hope that it may help them to get all there is out of an overhaul job and to show other dealers how this quality service would prove a new source of profit to them.

Logangears are made for every size and type of flywheel. Full details sent on request.

Kauffman Metal Products Company
Toledo, Ohio

LOGANGEARS



The Logangear is made of a bar of special alloy steel, shaped to a ring, heat treated and electrically welded at the joint. It has no weak point. The gear teeth are then cut to accurate pitch and given a scientifically correct chamfer which insures a perfect mesh with the starter pinion. The finished ring is then hardened.

The teeth are rounded to an angle of 45°—a design which was developed in collaboration with one of America's greatest Starter manufacturers—and which affords quietness of mesh and maximum strength in each tooth.



Axle Nut Assortment

This bag contains an assortment of 50 axle nuts—which are sufficient to fill the replacement needs on over 226 makes and models of cars, trucks and taxicabs.

A small investment offering an opportunity for large profits. Assortment can be kept complete through your jobber.

Write for price list and chart.



\$100

**Lower
in Price**

Bigger Profits

1,100 dealers are making money handling Gardner cars. But we want more.

The discount is big, the line is complete, and the car out-performs anything in its class.

The price has been reduced \$100. The quality has been maintained.

Our contract is a fair, safe, one-page contract in plain English.

Gardner has the background of experience and the backbone of financial strength—41 years of successful manufacturing.

You can add Gardner cars to your present line, cut your expenses and increase your profit.

Developments planned for 1924 and 1925 assure maintenance of the Gardner car's prestige—which spells success and profit for both of us.

It will pay you to get particulars. Write or wire today to The Gardner Motor Company, Inc., St. Louis, Mo.

\$895

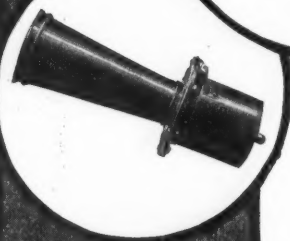
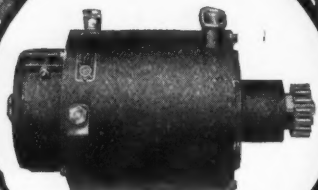
F. O. B. FACTORY

See complete line at
New York, Chicago
and all other leading
Shows.

GARDNER

NORTH EAST

Starting Lighting Ignition Horns Speedometers



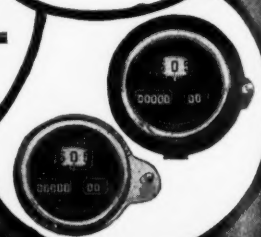
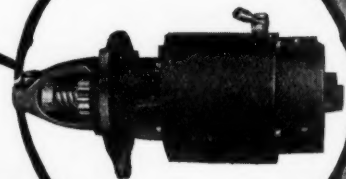
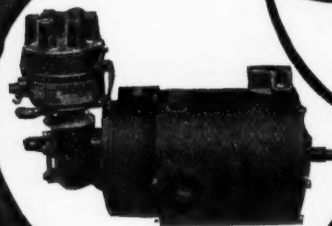
WHERE DEPENDABILITY COUNTS

BACK in the days when Motor Cars were still cranked by hand and lighted by gas or oil, North East Equipment began to set the standard for long life and ruggedness in the electrical system.

It is because of this long life and ruggedness that you will now find North East Starting, Lighting and Ignition Equipment, Horns and Speedometers used in this country and abroad on automobiles, motor buses, taxicabs, trucks, tractors and motor boats where dependability counts.

NORTH EAST ELECTRIC CO.

ROCHESTER, N. Y., U. S. A.



WHEN Automobile Show time rolls around, we all see the definite and tangible strides made by the industry in improvements which provide greater safety, convenience and economy in personal transportation, advances which have transformed the automobile from a luxury to a necessity—from an expense to an investment paying excellent profits through increased personal efficiency.

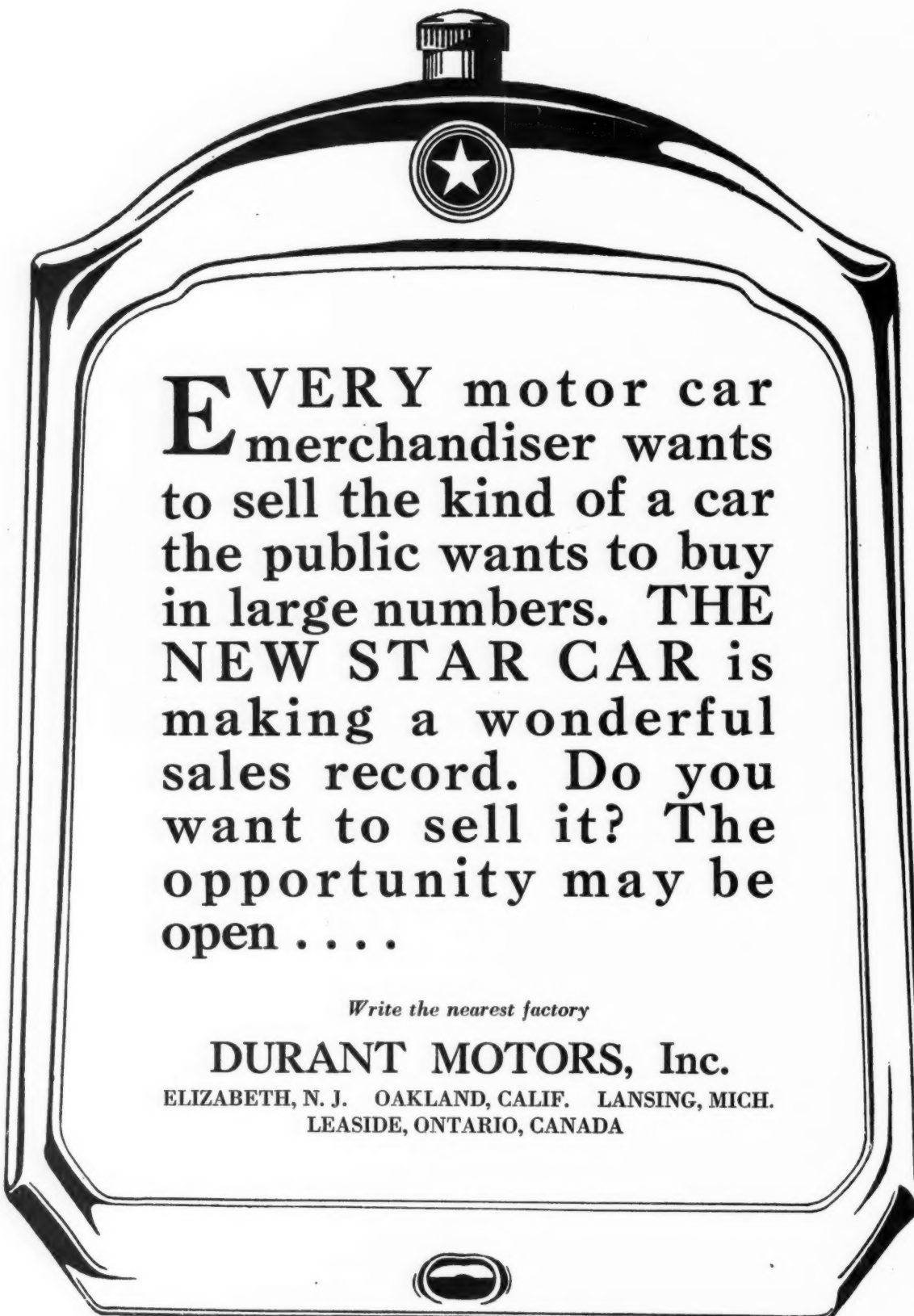
We do not see, but we all know the corresponding progress which has been made and is being made in stabilizing the industry itself.

In the part which our organization has been privileged to have in the industry, our endeavors have been directed with these points—progress and stability—in view. Increased service and dependability for the car manufacturer, the trade and the motor car driver are the reasons for additions to our line which are being offered and will continue to be announced.

L. H. GILMER CO.

Tacony, Philadelphia

Headquarters and Exhibit
15th Floor Commodore Hotel, New York City
Week of Jan. 5th



EVERY motor car merchandiser wants to sell the kind of a car the public wants to buy in large numbers. **THE NEW STAR CAR** is making a wonderful sales record. Do you want to sell it? The opportunity may be open

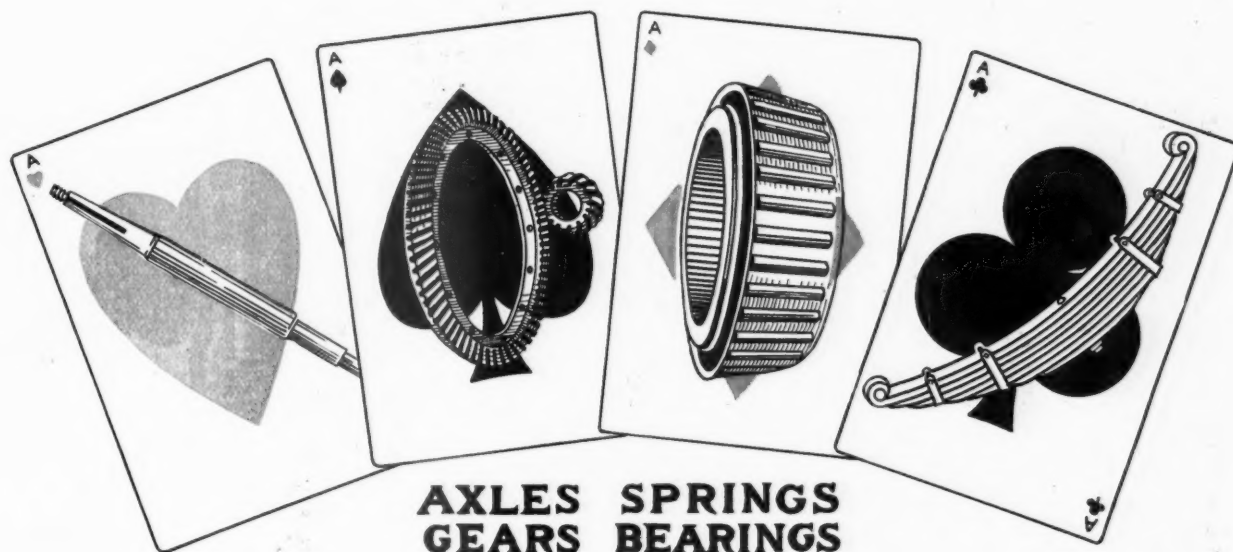
Write the nearest factory

DURANT MOTORS, Inc.

ELIZABETH, N. J. OAKLAND, CALIF. LANSING, MICH.
LEASIDE, ONTARIO, CANADA

you win!

FOUR ACES BUTLER PRODUCTS



You can't lose on a Butler deal. Butler products are aces. If you let Butler deal you four cards you will be protected and—
“you win.”

Butler

BUTLER AUTOMOTIVE SERVICE CO.
EASTON, PA.

NO one can tell you which of two cars in the same price class is the better. Individual taste is the deciding factor—as it is in most everything you buy or sell.

But not so with bolts and nuts. Tastes do not figure. Facts do. It is either a good bolt or nut, or it isn't. It is either an Empire, or it isn't. If it is an Empire, you have no worries. It won't strip its threads or fracture or refuse to fit—or any of the other common bolt and nut vagaries that cause come-backs and complaints.

Packed in new sales-pulling display cartons, ingeniously labeled, Empire bolts and nuts help in their own turnover. They invite purchase. Ask your jobber.





THE mere fact that the bolts and nuts you sell are so attractively put up, so interestingly displayed, and so conspicuously marked for size and style, is a big point in your favor.

RUSSELL, BURDSALL & WARD
BOLT & NUT COMPANY
 PORT CHESTER, N.Y.

PEMBERWICK, CONN. - CHICAGO - SAN FRANCISCO - ROCK FALLS, ILL.

Makers of Bolts, Nuts and Rivets Since 1845

EMPIRE BOLTS

BOWSER
ESTABLISHED 1885

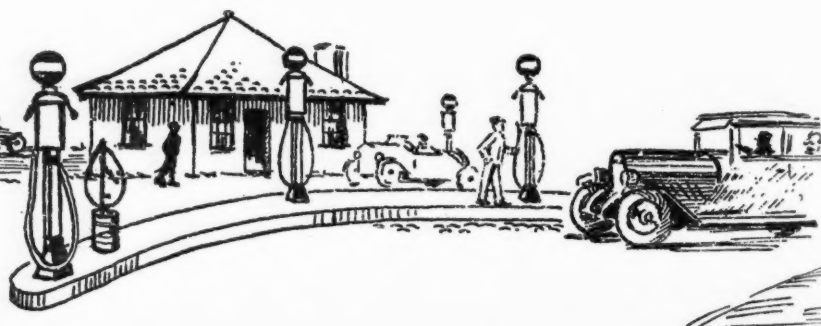
Much Faster Service

Here's the fastest - operating gasoline pump ever built—the Bowser Post Sentry!

With it, you can handle sixty customers an hour, that is, if you can spot cars that fast!

The Post Sentry is built of standard time-tested Bowser units. In the garage, or filling station, is a Bowser double-acting power pump and the patented Bowser centrifugal separator that takes all the water out of the gas as it is being served. In the Post itself is the line valve, with electric switch to the motor.

The Post Sentry is the newest thing for gasoline selling. It has been tested by nine months of





e with This Bowser Post Sentry

actual service, by many different people, under all conditions. One pump inside your garage will handle one or several Posts—one on the curb, and one in the shop, for instance. Thus you save all the cost of separate pump units, yet get the several delivery points you need.

The Post Sentry is extremely economical, too—and unusually simple in construction.

Don't install new pumps anywhere, or consider replacing old ones, till you've heard the Post Sentry story. It's all in a new illustrated bulletin.

This Book Helps Profits



*How to Sell More
Gas and Oil*

Our new book, "How to Sell More Gas and Oil" tells 29 proven ways of increasing sales—how to handle customers so they will buy more each time they visit your garage, so they will like to come oftener, so they'll come to your garage more regularly.

It's the little things that count in increasing filling station and garage trade. It's those little things we tell about in the new **free** book—tell about so simply and clearly that even a new man will do your garage credit from the very start.

Your copy of "How to Sell More Gas and Oil" is ready now. Send today. Address Dept. A14.

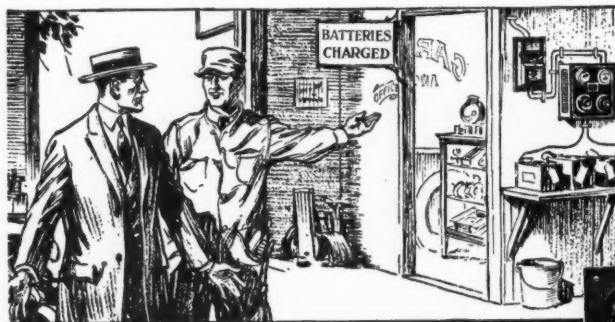


S.F. BOWSER & COMPANY, Inc.

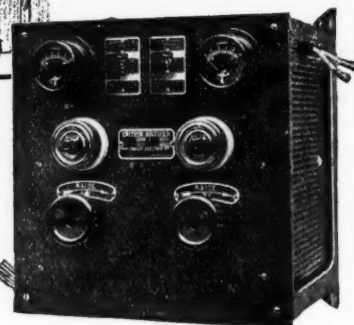
Pump and Tank Headquarters

FORT WAYNE, INDIANA.

Sales and Service Offices and Representatives Everywhere



All Year 'Round vs. Seasonal PROFITS!



DON'T let others make your profits! Drop into a shop that **does** do battery recharging and see how you're playing right into your competitors' hands.

While shop repairs and accessory sales drop with each drop of the thermometer, these **completely equipped** shops more than fill the gap with the big increase in battery charging jobs. The battery charging profits you turn away, because you haven't a UNITRON Rectifier, help make the other fellow's shop a big payer ALL YEAR 'ROUND.

Right Now, your regular customers need battery service. Cold weather tears down batteries at a furious rate. Motors are harder to start. Most driving is done in the dark with lights draining the battery for hours at a time. The generator has very little chance to recharge the battery. **RESULT**—batteries have to be recharged very frequently. Here's big profits, you're missing because you haven't a UNITRON Rectifier.

NOW is the very best time to install a UNITRON. At the beginning of the big battery recharging season, the UNITRON will pay for itself most rapidly. Costs the least to buy per battery capacity. Bulb guaranteed for 1000 hours. Handles your battery charging business almost automatically. Very little attention and practically no upkeep. The safest, most efficient, most profitable type of battery recharging equipment for your business.

Ask a UNITRON distributor to produce the facts. Write or phone NOW.

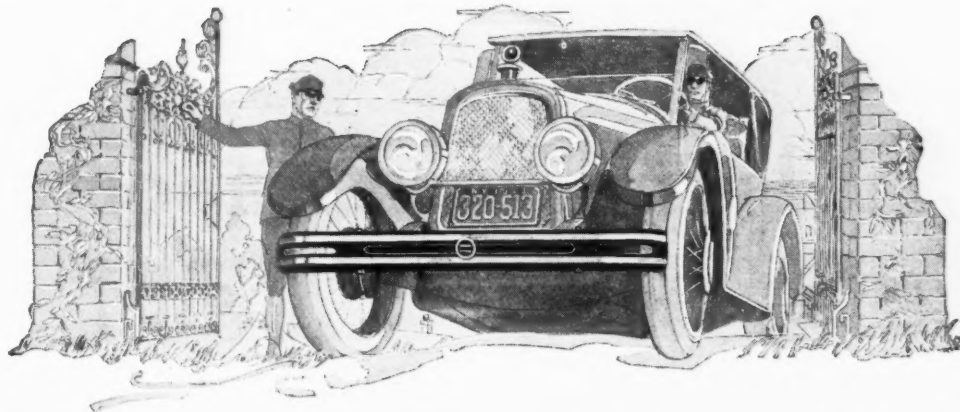
Write for literature! Call up the nearest distributor of

Forest Electric Battery Service Equipment!

FOREST ELECTRIC CO.

New and Wilsey Streets, Newark, New Jersey





FEDERAL BUMPERS

A motorist's first impression of Federal Bumpers on a car is the appearance of unity—the effect of being an integral part of the car.

The sweep of the front, the obvious strength without clumsiness, the indescribable beauty—all claim instant attention.

Closer inspection reveals to him:



*The Federal Trademark
—neat in design
and appearance*

The non-rattle, compact construction.

The beauty imparted by the embossed ribs—a development of pressed steel engineering which adds strength without needless extra weight.

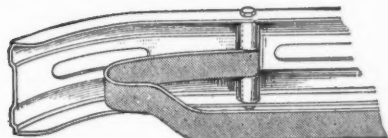
The double contour of the cushioning spring.

The swivel joints by which this spring is secured to the one-piece front—a construction that substitutes spring eyes and vertical bolts for weakened, pierced spring ends and horizontal bolts. A construction that allows distribution of blows applied anywhere, to the whole bumper and reduces strains on frame horns.

The Federal Metropolitan Model conforms to the most advanced requirements of motorists—it enhances the beauty with added protection.

Jobber distribution is progressing as fast as production and delivery permits. Catalog No. 11 gives complete details on the complete line of Federal Bumpers, which includes the Metropolitan Models and the double bar spring bumpers (Broadway Models).

*Also manufacturers
of brake drums,
disc wheels, and
heavy stampings
of all kinds*



The cushioning spring is not attached rigidly by a bolt passing through a hole pierced in the spring—instead the spring is formed into an eye at both ends, through which a vertical bolt passes, making a flexing swivel joint. Impacts are distributed to the entire bumper due to this method of support, reducing strains on the car frame horns.

FEDERAL PRESSED STEEL CO.

Jobbing Division Office
London Guarantee & Accident Building
Michigan Boulevard Bridge
CHICAGO
Plant: Milwaukee, Wisconsin

See Exhibit Booth 231, Main Floor New York Show

Tear out this reminder and mail

FEDERAL PRESSED STEEL COMPANY, *Jobbing Division Office*
London Guarantee & Accident Building, Chicago, Ill.
Mail Catalog No. 11 on Federal Bumpers to

Name _____

Company _____

City _____

State _____

What Is the Most Important Replacement Item?

The December 13th issue of this paper published a chart prepared by General Motors Research Corporation showing what parts cause the motorist to visit the repair shop most frequently.

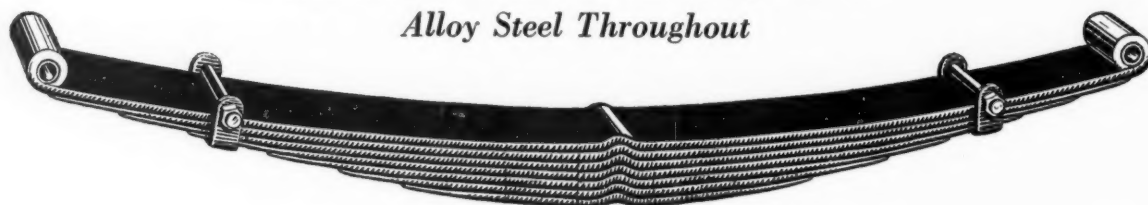
Springs are shown as causing the most visits by far.

There are almost fourteen million cars and trucks running around the country at this time and if springs have to be replaced more often than any other part can you even begin to realize the volume that is possible for you?

TITANIC Springs are the best springs made and they are much more profitable than any other. TITANICS fit properly, go on easily and they **stand up**. Ask us or any distributor about our attractive Service Station Proposition on

TITANIC SPRINGS

*Guaranteed Forever at the Hump Center
Alloy Steel Throughout*



Tuthill Spring Company

760 Polk St., Chicago, Ill.

Builders of Quality Springs for Over Forty-three Years

"2-Point-Test"

TRADE MARK

HYDROMETER

A Quality Instrument—Priced So You Can Make a Worthwhile Profit

In announcing the "2-Point-Test" Hydrometer we are meeting the demand for a really accurate, high quality instrument. Notice that this hydrometer is **factory tested at both points on the float scale**. This is the only sure means of determining the accuracy of a hydrometer. An instrument may register correctly at one point yet give a false reading at another point. The only means of eliminating guess-work is to test each instrument at both the high and low point. The ordinary hydrometer is not tested in this way because of the expense involved.

We offer the "2-Point-Test" Hydrometer to the trade with positive assurance that it can safely be guaranteed as an absolutely accurate and dependable battery tester.

\$2.50

Patented
July 12, 1921
Other Patents Pending

ACCURACY IS GUARANTEED

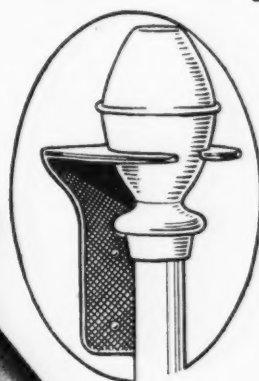
For the first time a battery tester is being sold to car owners on the basis of accuracy—and what good is a battery tester if it is **not** accurate? You will find no trouble getting \$2.50 for this instrument when you explain this point to your customers.

FLOAT CANNOT STICK

Strips of green celluloid inside the glass cylinder act as guides for the float and make it impossible for the float to come into contact with the cylinder wall at any point. This feature will go over big with every man who has ever used a hydrometer.

Distribution is being made to the trade through legitimate jobbing channels only. Write for complete information, mentioning your jobber's name.

It's tested
at both points!



N & N HYDROMETER CO.

3715 W. Grand Ave.
CHICAGO

A WALL
HANGER IS
FURNISHED
FREE WITH
EVERY INSTRUMENT



Sales Dept., J. WADSWORTH STAFF
118 N. LaSalle St., Chicago



A New Basco Universal Switch at a New Low Price of \$3.00



No. 37880—same as 37950, with extra terminal for separate control of side, tail or parking light. Price \$3.50.



No. 37950 — Basco Universal Switch, with Dim, Off and On light positions and ignition controlled by barrel-type tumbler lock with wide variety of keys. Price now \$3.00.

STOCKING this new Basco Universal switch, instead of the thousand-and-one varieties of ordinary switches needed to make a complete stock, cuts your switch sales overhead in half.

For this handsome Basco Universal Switch fits most makes of cars or trucks—magneto or battery ignition, single or double wire system, resistance or two-bulb selective dimming—they're all provided for, and the terminals plainly marked on the back. No guess-work—no puttering or experimenting when you install switch—just hook the leads to their respective terminals, fasten it to the dash and the new Basco Universal works **RIGHT**—every time.

It costs the customer less to buy; it costs **YOU** less to stock, less to sell, less to install. And, our word and guarantee for it, it'll cost you nothing to "service". What profit you make "stays put".

OTHER BASCO PRODUCTS: Starting, Lighting and Ignition Switches; door handles, generator cutouts, regulator cutouts and motor-driven horns.

Briggs & Stratton Co.
Milwaukee  Wisconsin

The Many Reasons WHY the Ever-Hold Dominates the Field of Better Hose Clamps

WHY waste time and energy with old fashioned clamps which are unhandy to install, when the Ever-Hold is applied in a few seconds?

WHY bother with a dozen sizes, when two sizes of the Ever-Hold will fill the bill?

WHY lose time and temper hunting a lost nut, when the Ever-Hold nut is a fixture?

WHY have bleeding hands from sharp cornered clamps, when every Ever-Hold corner is round and smooth?

WHY use clamps that are soon covered with rust, when you can get the rust-proof Ever-Hold with the nickel-plated screw?

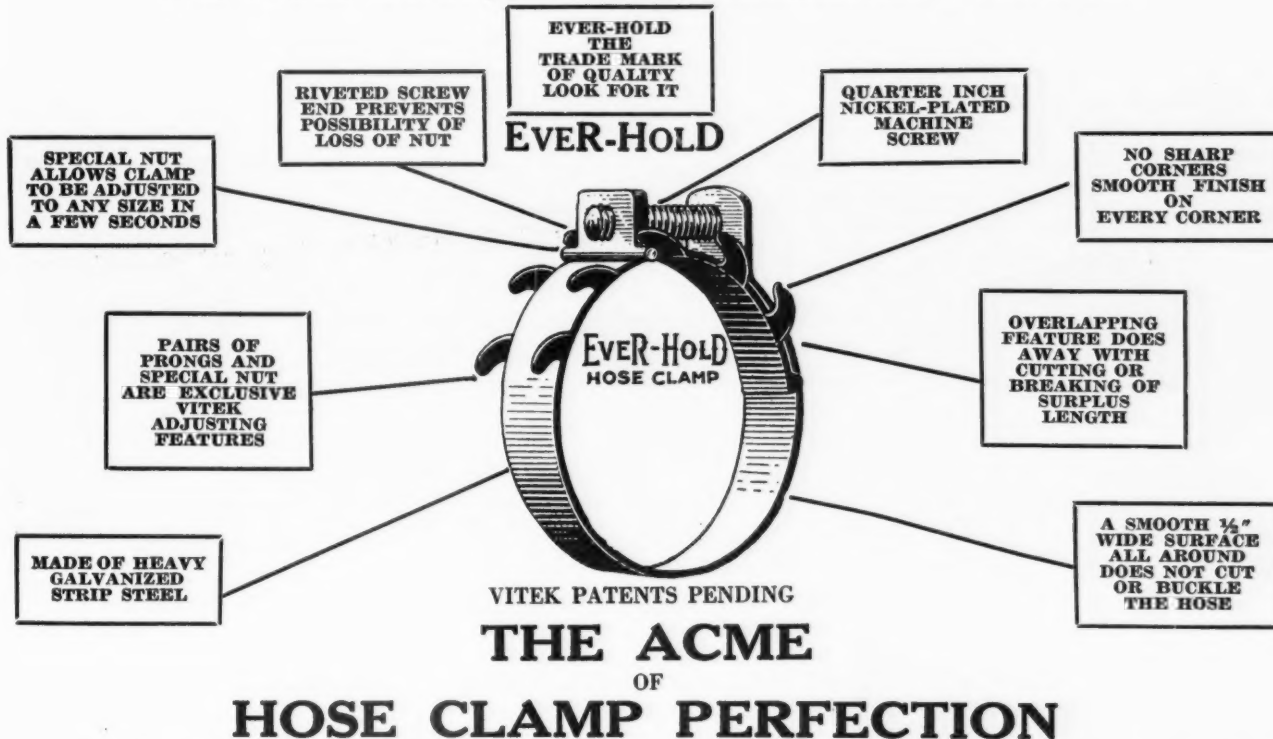
WHY detach the nut to adjust your clamp, when the Ever-Hold is adjusted without removing the nut?

WHY use a clamp which allows leakage and has weak points, when the Ever-Hold is a continuous band of unlimited strength?

WHY bother with unassembled clamps, when the Ever-Hold is permanently assembled, and rolled, as shown in the cut below?

WHY Anything But Ever-Hold?

The Hose Clamp of Many Exclusive Features



The choice of the U. S. Air Mail Service, where a faulty hose clamp spells disaster. Ever-Hold will stand the gaff!

The regular No. 3 Ever-Hold is a universal size, and will fit 90% of the hose sizes used in the garage. The No. 4 will fit the other 10%, while the No. 1 and No. 2 clamps will fit any hose from 1/2" to 1 1/4".

Ever-Hold clamps are used on autos, trucks, airplanes, garden hose, welding hose, and wherever hose is used.

Buying poor clamps at good clamp prices is poor policy. You get 100% value for your dollar when you buy Ever-Hold.

MR. DEALER

Insist on quality hose clamps. Your jobber carries the Ever-Hold clamp. Trade mark on every clamp and carton. Be sure to find it. If your jobber does not have what you want, write direct to us.

PUT IN A GOOD STOCK NOW

THE EVER-HOLD

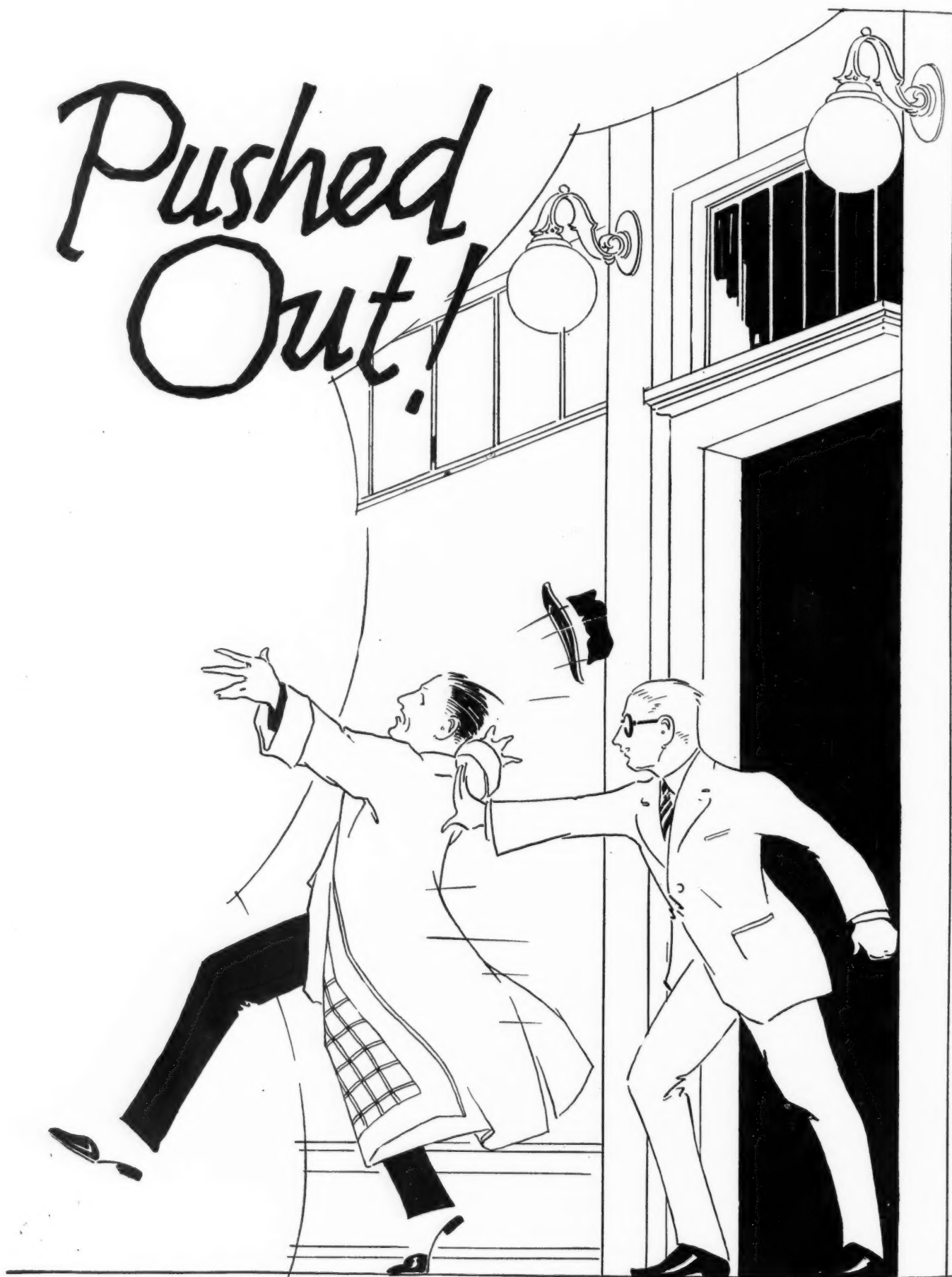
Is Made By

THE
VITEK MANUFACTURING CO.
Industrial Bldg., Omaha, Nebraska, U. S. A.
Pioneer Makers of High Grade Hose Clamps

MR. MOTOR CAR MANUFACTURER!

We want your hose clamp business. The Ever-Hold will add another important improvement and talking point to your product. Better clamps make better cars. We will be glad to send you free samples and to quote our best prices.

Pushed Out!



THERE is a beautiful display room on one of the prominent boulevards of Chicago. It is decorated with flowers and potted ferns, and it also has a car or two on the floor.

A car owner dropped in to buy a battery. The dealer said, "We don't handle batteries and accessories. We sell cars."

The customer said, "What are you running, a flower shop or a transportation store?"

This dealer might as well have pushed his customer out the door.

If the average dealer will take the trouble to learn what we've been digging up on the subject of battery merchandising, it is a sure bet he will pull up his chair and ask questions. There's money in selling Vesta batteries and there's no grief. We can prove that.

The Vesta Battery possesses a distinctive and exclusive feature of self-evident merit, in its patented Isolators. It has stood the test of time as has the institution behind the product.

It isn't necessary to organize elaborate service to sell batteries. A small stock does the trick. Vesta batteries are proving great money makers every day. Stock up with good accessories and don't push your customer out the door.

VESTA BATTERY CORPORATION

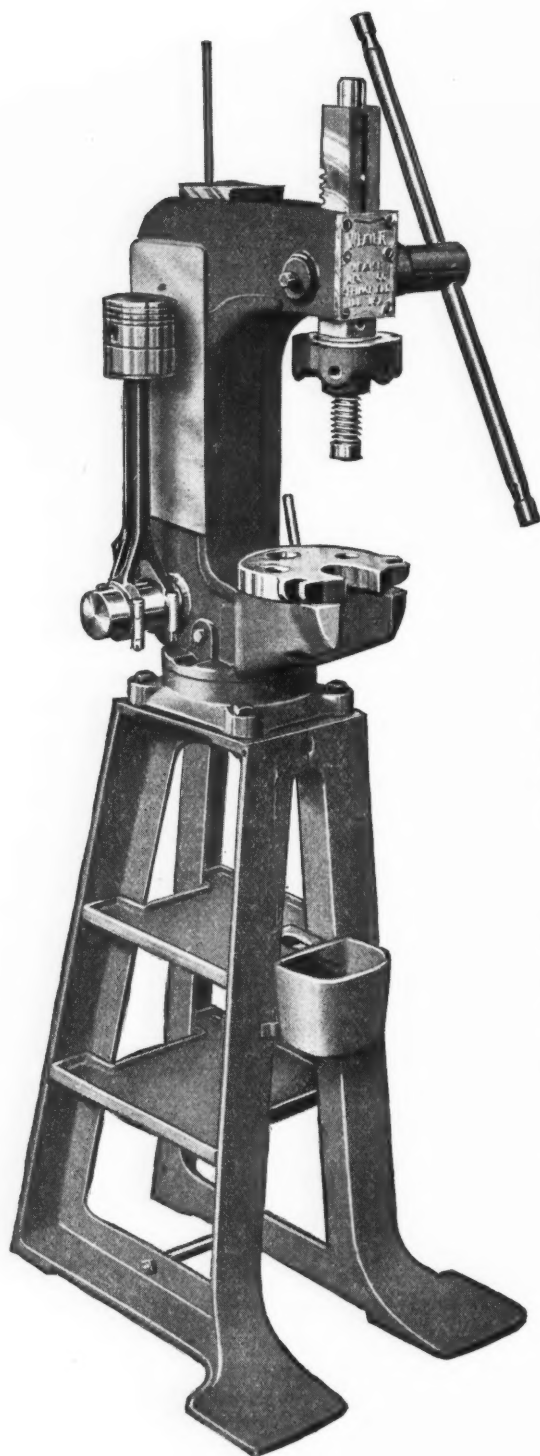
Chicago, Illinois

VESTA
STORAGE BATTERY
Costs Less Per Month of Service



Announcing the New **WEAVER** **Motor Service** **Press**

The Pictures Tell the Story



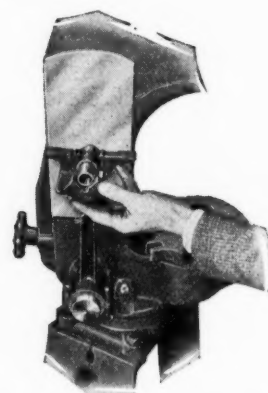
If your shop handles any pressure or straightening work, fits connecting rod assemblies, relines brake bands and clutches—in fact, if you operate a shop at all—you can use the new Weaver Motor Service Press to advantage.

It is the product of years of experience, study and experiment on the part of the pioneer builders of garage equipment to supply a more economical, accurate and convenient means for handling hundreds of jobs that come into your shop daily. It combines the services of at least a dozen essential tools at a fraction of their cost, if purchased separately.

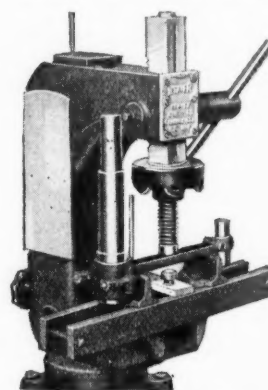
A few of the innumerable ways you can use this new Press to advantage in your shop are shown in the accompanying illustrations. A complete description is given in a special folder just off the press. Your copy is waiting to be asked for. Write for it now.

WEAVER MFG. CO.
SPRINGFIELD, ILLINOIS, U.S.A.

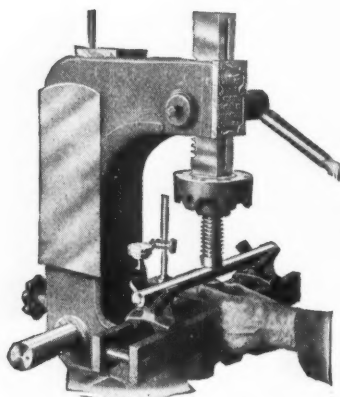
Weaver Canadian Co., Ltd., Chatham, Ont.



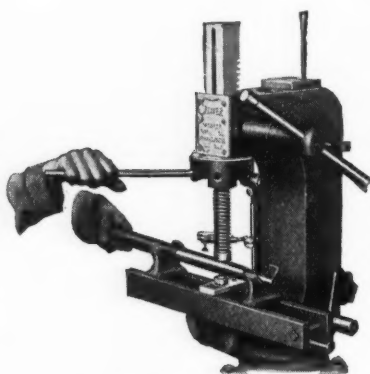
Twists or bends are readily detected by the Test Block.



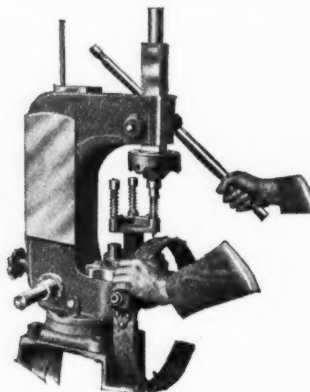
No need to remove pin when straightening connecting rod.



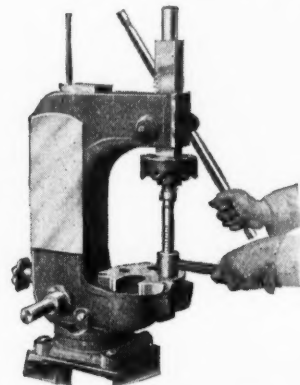
V Blocks support shafts for straightening.



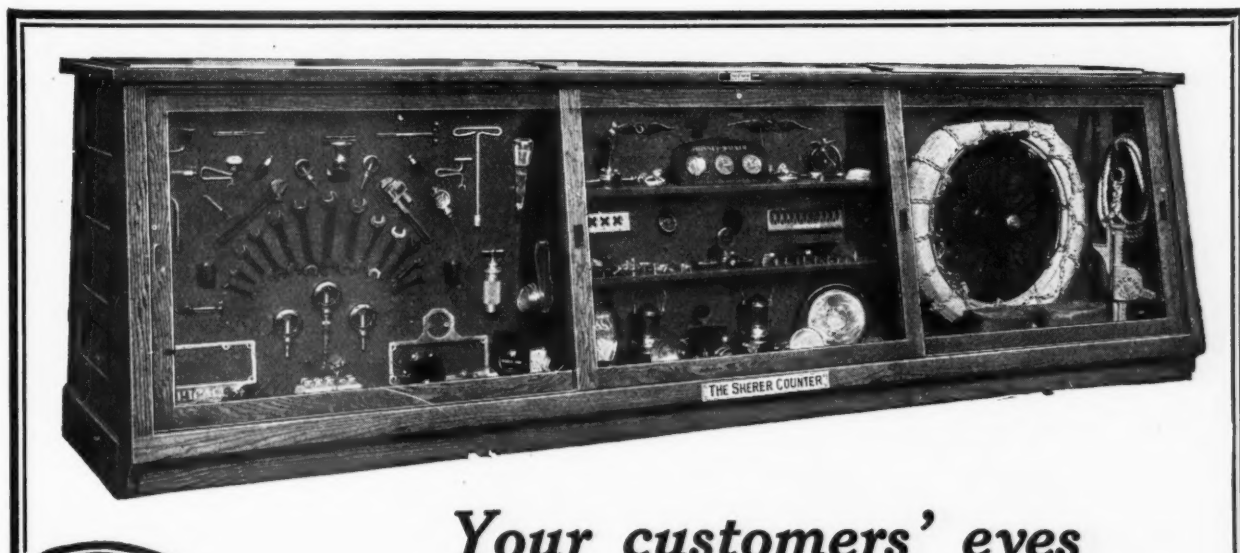
Screw used for heavy pressure work.



Brake bands and clutches relined quicker and better.



Connecting rod bushings quickly and accurately broached.



**This
gives you display
plus storage**

The Sherer Accessory Case gives you 50% more display surface than the ordinary case.

Gives you ample storage.

Glass sliding fronts that can be locked.

Drawers that can be locked.

Made of selected oak and clear glass—it is a beauty.

The drawers are big—14½ in. long, 11⅞ in. wide; they are in three depths—3¾ in.—7 in.—15⅜ in. figured out so as to take all kinds of Accessories.

The Sherer Accessory Display Case is furnished in 3 standard lengths as follows: 8 ft. 8 in.—12 ft. 2 in.—15 ft. 10 in.

**It tells
them
to
buy!**



Your customers' eyes open their pocketbooks—

Nobody but a blind man buys things without seeing them. And the more we see the more we buy. The Sherer Accessory Case gives you attractive display under glass.

Common sense tells us that the Accessories that will sell are those that are given the chance to sell. In plain view on your sales floor. You can't expect to sell spark plugs, wrenches, motor meters, grease guns or tire chains if they are hidden away in a store room or kept out of sight. Put them in a—

SHERER -ACCESSORY- DISPLAY CASE

and watch your sales jump.

Your customers enter your store—see this attractive silent Sherer salesman with the Accessories displayed and immediately think of their car needs.

And with 13 million automobiles in use, each averaging 5 or 6 Accessories per car, there is certainly a share of this business awaiting you.

The Sherer Case quickly brings added profit to pay for itself. The idea of silent selling is becoming more and more profitable and it is a wise Dealer who gives the Sherer Accessory Display Case a chance to speed up his sales, increase his turnover and build up a permanent profit.

Moreover—this silent Sherer salesman makes all Accessories sell easily.

For 70 years we have manufactured and sold store equipment of the better sort. Our experience enables us to give you practical advice.

The benefit of our experience is given for the asking. Write in today for catalogue M.A. It explains "silent selling with a Sherer."

Sherer-Gillett Co.

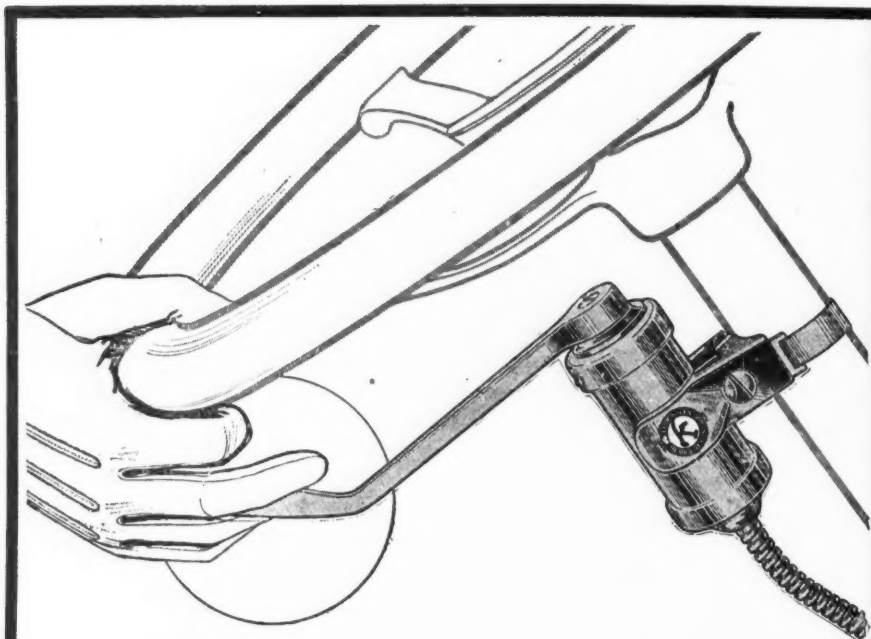
Manufacturers of Counter and Display Equipment
17th and S. Clark Sts., Chicago

SHERER-GILLETT CO., 17th and S. Clark Sts., Chicago

Gentlemen: We would like to know how to give our Accessories a better chance to sell as you suggest in Motor Age, and therefore ask you to send us your special proposition on a case.....ft. long.

Name

Street City..... State.....



LORENTZEN Headlight Kontrol

(Patents Pending)

"Makes You Like to Drive at Night"

The accessory that went
big in 1923 and will go
bigger in 1924—

Ask Your Jobber
He Knows—

Don't wait for his Salesman to call—write him



What it is

IT dims headlights by stages that blend one into the other—exactly the same principle by which the house lights of a modern theatre are "turned up" and "turned down."

It is operated by a touch of the fingers without removing hands from the steering wheel, feet from the operating pedals or eyes from the road. It can be attached by anyone in 10 minutes with a screw driver.

It is handsome in appearance.

Only two sizes necessary to fit all cars. No. 1—6 to 8 volt. No. 2—12 to 16 volt.

It is packed in a carton easy to ship and handle.

It sells for an ideal price—\$7.50 list, with liberal discounts to the trade.

It offers exceptional sales opportunities. It is backed by effective sales helps. It is sold thru regular jobber and dealer channels only.

It has every possible good selling feature both as to product and merchandising plan.

It will surely make money for you.

INVESTIGATE.

**LORENTZEN
HEADLIGHT
KONTROL, Inc.**

**60 Grand Street
New York**

NOTE: We shall be pleased to receive visitors to the New York Show at our factory—'phone Canal 1717 for appointment.

Our Booth at the New York Show No. 322 Main Floor

—What it does—Why it sells

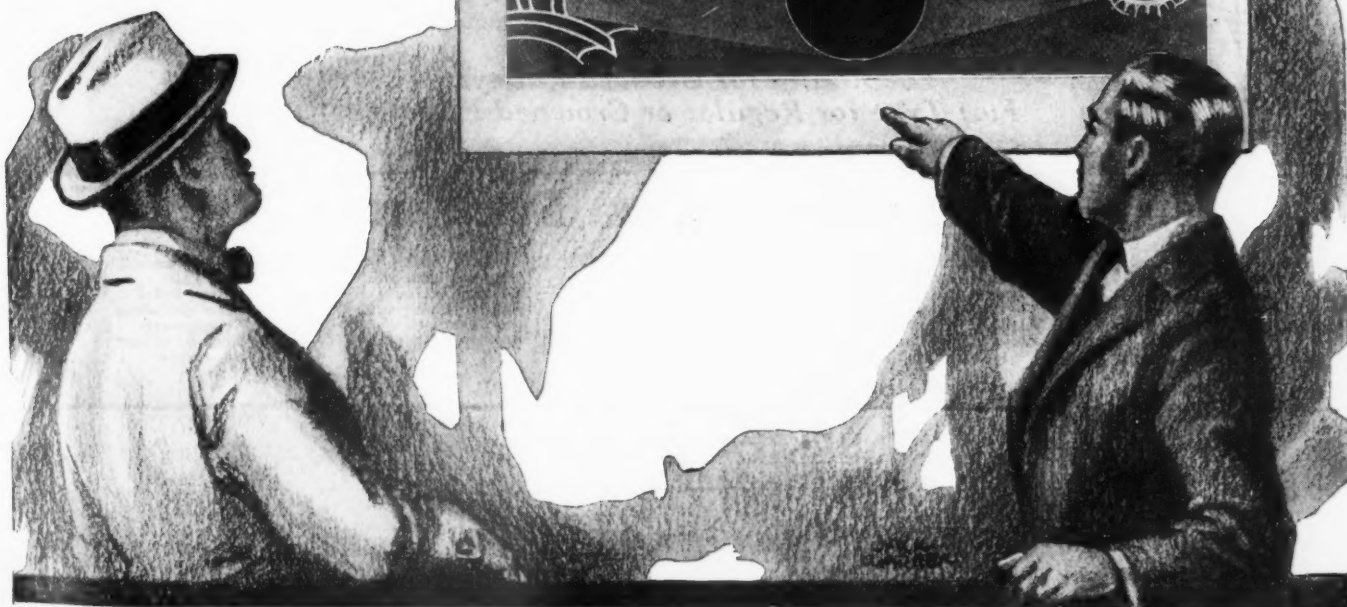
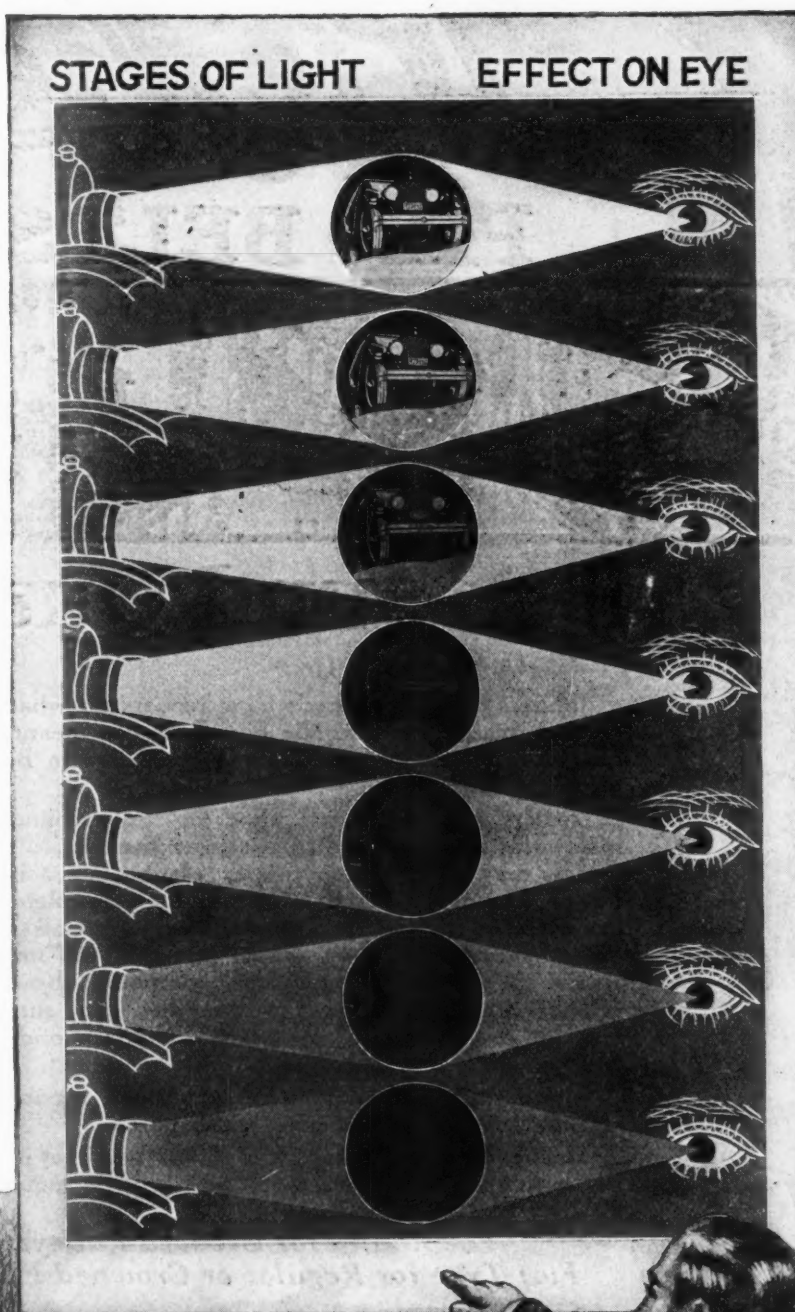
The Seven Stages of Lorentzen Headlight Kontrol

Headlights are dimmed by two extended fingers of one hand on the wheel.

The different degrees of light blend, one into the other, so that pupils of eyes (of the oncoming driver, the pedestrian and yourself) gradually enlarge as light is decreased.

An oculist will tell you that this means perfect vision at all times.

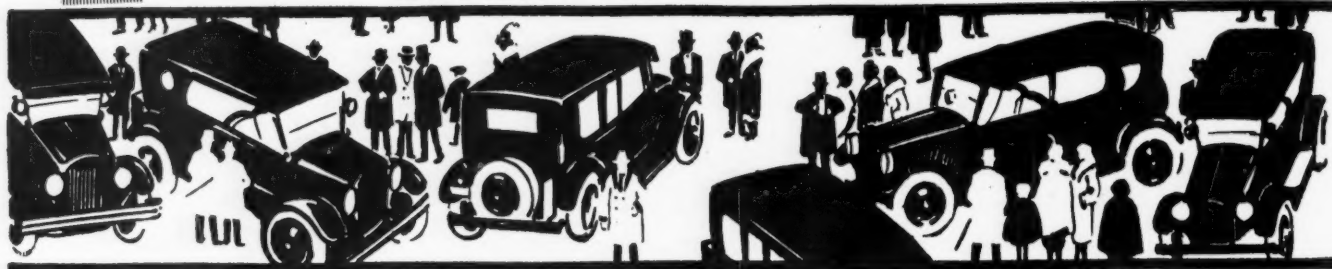
It's the blind spots which occur when light is suddenly lowered or increased that cause accidents. See diagram for graphic explanation.



Rie Nie

Trade Mark Reg.

FAN BELTS



All Around Quality

Jobbers by the hundreds have recognized what the "All around quality" of Rie Nie Fan Belts has meant to them. Last year **every jobber** handling Rie Nie Fan Belts made money on them.

Dealers too, appreciate that the "all around quality" means faster sales and sure repeat business. Their customers may buy a higher priced belt, but not a better one. **Fewer sizes of Rie Nie Fan Belts make a complete stock for the dealer**—a quicker turnover and better profits. Constructed of fabric of highest tensile strength and impregnated with a specially prepared rubber compound these belts are oil, heat and waterproof. For durability, firm, sure grip and long life even under the most severe driving conditions, Rie Nie Fan Belts are unexcelled.

There is a Rie Nie Belt to fit every make of passenger car, truck, tractor and circulating water pump.

Most every jobber has them. Write us direct if your jobber hasn't. Rie Nie Fan Belt Chart sent on request.

*Carry one
in your car
wherever
you are*

**Vee Round for Grooved Pulleys
Flat Type for Regular or Crowned Pulleys**

Rie Nie Automotive Products

All in One Dressing
Aluminum Enamel
Battery Paint
Bearing Blue
Clutch and Brake
Compound
Enamel (Air Drying)

Enamel (Cylinder)
Fan Belts
Gasket Cement
Graphite
Leather Dressing
Metal Polish and
Nickel Polish

Patch
Pedal Pads
Polish—Auto Body
Radiator Cement
Orange Shellac
Radiator Hose

Rim Paint
Rubber Cement
Shellac (Gasket)
Rubber Filler and
Cement
Spring Lubricant

Tire Mica and Tire
Talc
Tire Paint
Valve Grinding
Compound
Varnish (Clear
Auto)

DURKEE-ATWOOD®
MINNEAPOLIS, MINN., U. S. A.



Have You Ever Thought of Selling STABILATORS as a Business?

WHILE you have watched the rising tide of STABILATOR success, has it ever occurred to you what a valuable thing it will be to control all STABILATOR sales in some important territory?

It is natural that STABILATOR distributor sales have not yet reached anywhere near their ultimate proportions. But even at this comparatively early period of development, territorial sales are big enough to warrant the

investment of considerable capital and to appeal to the highest type of business man in any community.

Within two short years nine of America's leading car makers, the kind whose prestige lends real sales value to their endorsement, and growing thousands of car owners, have adopted STABILATION in preference to everything else.

It is apparent to everyone who has examined the situation that

(Continued on next page)

it is only a matter of time when the distributors of STABILATORS will have one of the largest and most profitable businesses in the whole automotive field.

These big businesses everywhere will be controlled by the men who have the foresight to enter the business *now* while it takes courage, initiative and intelligent organized effort.

The able men who enter this business while control of valuable territories is still available will, as usual, be called lucky when the territorial sales reach their destined great volume.

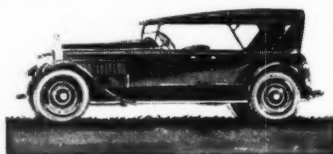
Even now, with over fifty thousand (50,000) STABILATED cars in every part of the country, with nearly two years of important national advertising back of them, STABILATOR sales have developed an impetus that makes

it possible for new distributors to build a profitable volume at once.

In considering the distribution of STABILATORS, do not think of it as an *easy* business or a spectacular, temporary business. It is a business that requires keen ability, but one that will produce profit in proportion to the ability and energy put into it. It is a business that will grow in rapid stages year after year. A permanent business big enough for a big man to stake his entire future upon it.

If that is the kind of business you are seeking, and if you have the experience, resources and ability to push such a business fast enough to warrant the control of an important territory, we would like to give you the information you need to consider it.

STABILATORS are already standard equipment on nine of America's finest cars—here is one of them:



PACKARD
STRAIGHT EIGHT

And importers of three famous European cars put them on immediately the cars are landed in New York.



WATSON
STABILATORS

JOHN WARREN WATSON COMPANY, PHILADELPHIA

CHANGE THE WHOLE NATURE OF YOUR CAR



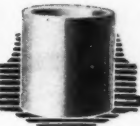
Anti-Frictionally Supreme

Scientifically alloyed and machined to close tolerances, Johnson Standard Automobile Bushings represent the highest achievement in anti-frictional qualities.

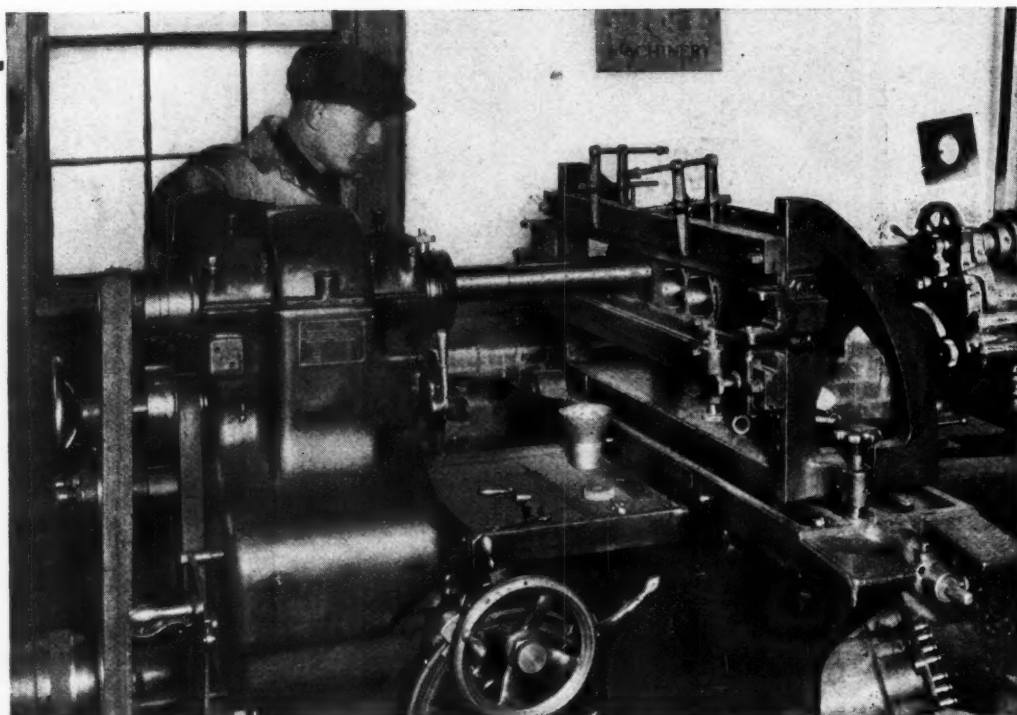
Johnson Standard Bronze Bushings come in all types and sizes, for all makes of cars and trucks, and are packed in cartons for convenient dealer handling.

Ask the salesman of any leading jobber or write for price list.

Johnson Bronze Company, New Castle, Pa.

JOHNSON  **BUSHINGS**

Look around you at the Evidence of



AT the show is a good place to check up the position that GRINDING ON A GRINDING MACHINE holds with the car-manufacturer. You will find that practically ALL fine cars have cylinders GROUND ON A GRINDING MACHINE. You will find the same thing true of pistons. And it isn't necessary to tell you this is also true of crankshafts, piston pins and steering spindle bolts, spring shackle bolts and various other short shafts.

GRINDING ON A GRINDING MACHINE is just as necessary to THE SERVICE STATION AND REPAIR-SHOP—as it is to the car-builder. When selecting your cylinder grinder

for general use in a repair shop, keep in mind the SIMPLICITY of the machine.

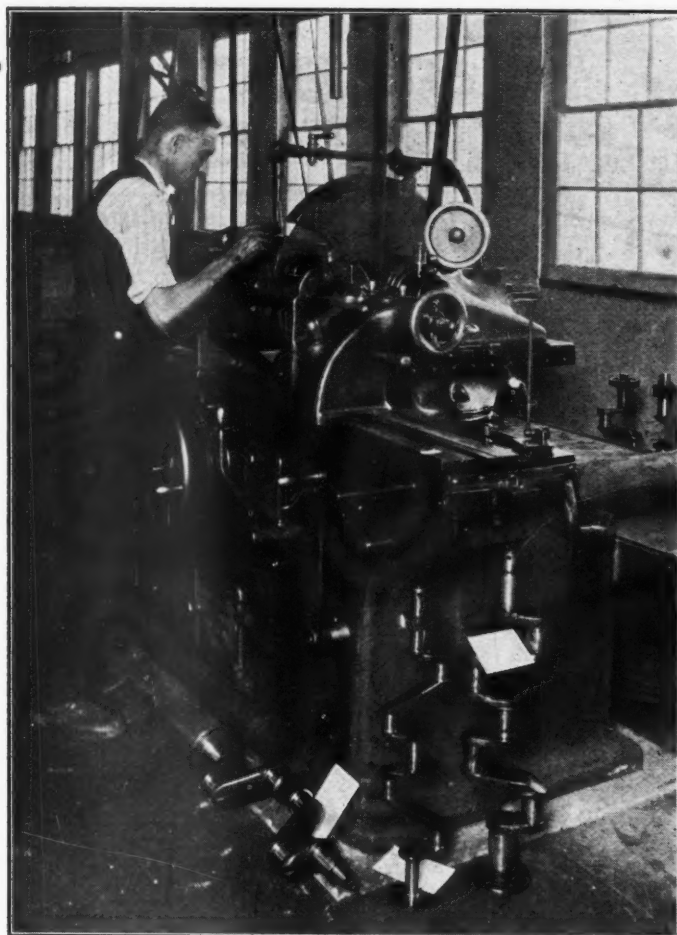
THE Landis Cylinder Grinding Machine is a thoroughly high grade tool, capable of the highest class of work. It is built in the regulation Landis way—to the Landis standard of excellence.

There are but two traverse speeds, two eccentric speeds and two spindle speeds.

Better servicing is the coming requirement. Makeshift methods can't make good—for long. Resizing by grinding on a real grinding machine makes a job that you can stand back of.

LANDIS

Shows— GRINDING everywhere



When it comes to a general-purpose grinding machine for the repair shop—

You should realize that a grinding machine built for **MANUFACTURING** is not what you need. To answer the need for a specialized garage grinding machine, we developed the Landis No. 4-A Grinding Machine.

THE LANDIS 4-A Special is designed especially for use in **REGRINDING** automotive work. Quick and easy change from job to job. A crankshaft

now, piston later, tomorrow piston pins—whatever the job, it is done in true **LANDIS** fashion in the absolute minimum of time.

We are the largest builders of grinding machines. Due to this, we enjoy large volume and are in a position to offer distinct **PRICE** advantages.

Catalog and quotations gladly furnished.

LANDIS TOOL COMPANY, Waynesboro, Penna.

New York Office—30 Church St.

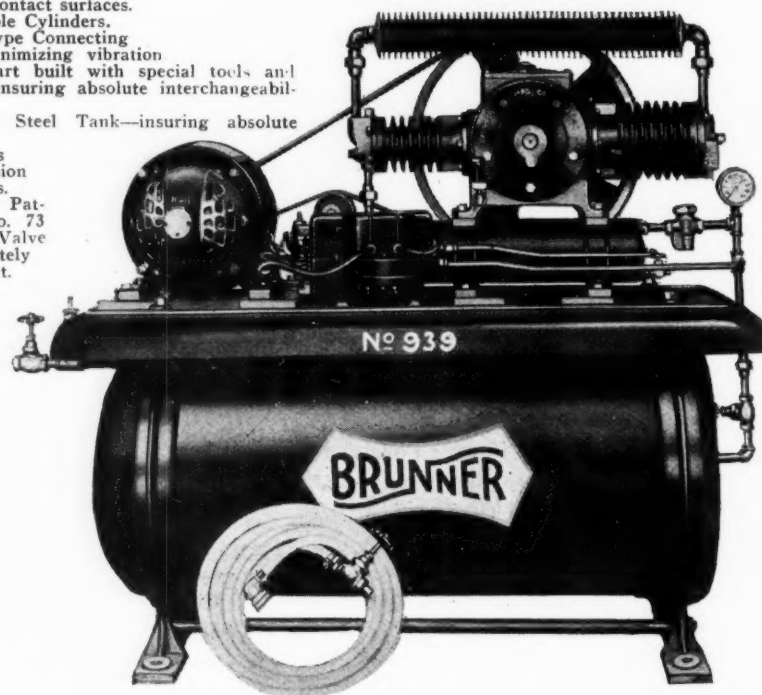


Every reason in the world for

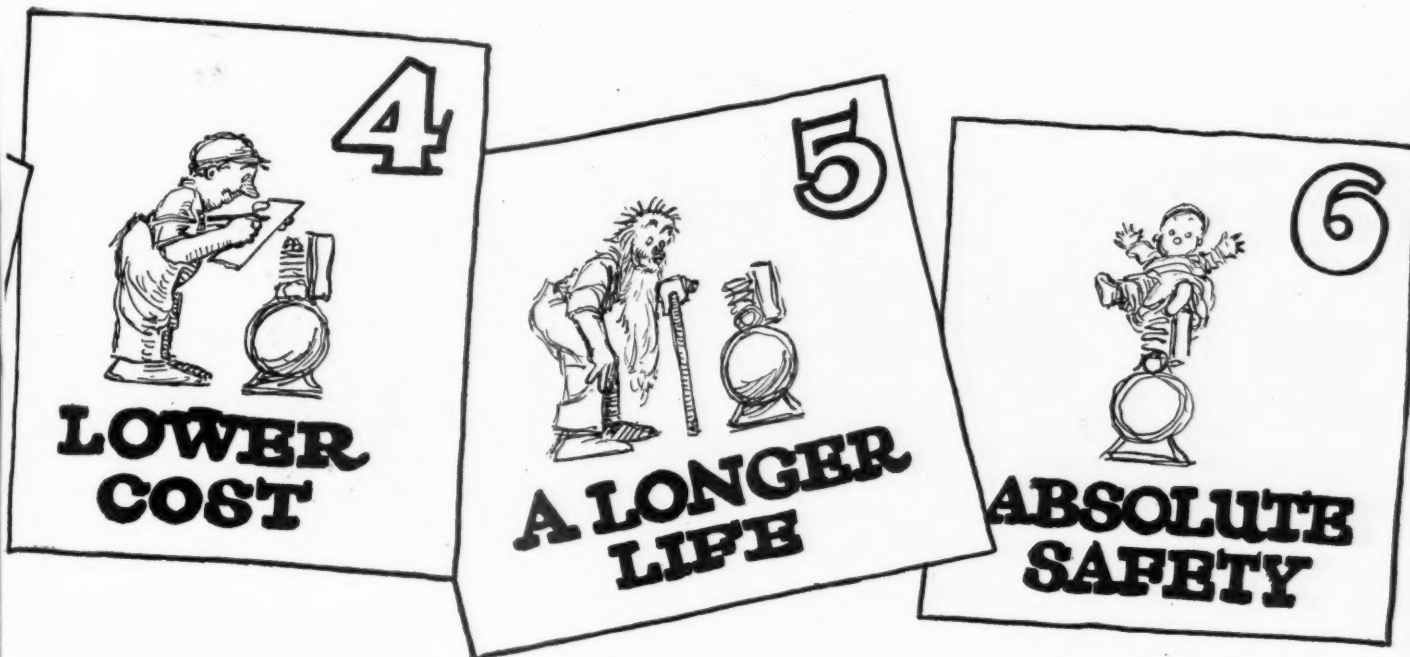


2-Stage 1924 Model

With 20 exclusive features, a few of which are:
 Extra large intercooler.
 Improved Belt Tightener.
 Ground contact surfaces.
 Removable Cylinders.
 Forked-type Connecting Rods—minimizing vibration.
 Every part built with special tools and gauges, insuring absolute interchangeability.
 Seamless Steel Tank—insuring absolute safety.
 Solderless Compression Couplings.
 Brunner Patented No. 73 Safety Valve—Absolutely Air Tight.



There is a Brunner to fit the particular needs of every garage or service station. All models described in catalogue. Write for your copy.



for buying a Brunner

PASTE this in your hat. You can no more conduct your business efficiently and economically—and thus secure to yourself its full measure of profit—without a good air compressor than you can carry on without the proper equipment in tools.

But “a good air compressor” doesn’t mean any old shaky contraption that happens along. Likewise the “buying of a good compressor” doesn’t mean surrendering to some glib tongued salesman who promises everything but proves nothing.

An air compressor certainly involves a sufficient outlay of money to warrant its more intelligent selection and to justify the comparison, point by point, of all the makes that are offered.

If you start comparing you will invariably turn to Brunner, for in the Brunner you will find a machine which represents unrivalled quality in every detail.

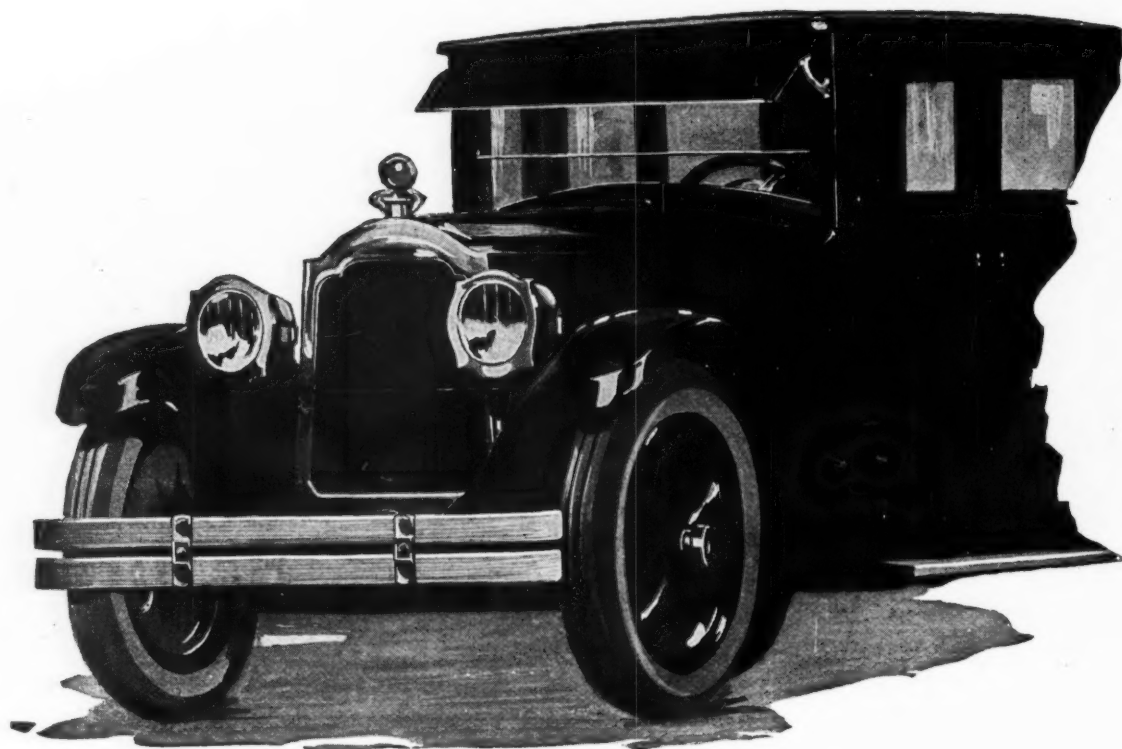
Built of the finest materials by the largest and oldest manufacturers of garage Compressors, in a plant where every safeguard is set up to insure close fitting parts and accurate contact surfaces, the Brunner naturally gives the very longest life of trouble-free service.

There is every reason in the world for buying a Brunner. Ask your jobber to prove the six points shown above.

BRUNNER MFG. CO.
UTICA, NEW YORK

BRUNNER

AIR COMPRESSORS



Winter

The changing seasons mean nothing to the strength of Hays Hickory Hitters. The coldest winter day—when finest steel becomes brittle as glass—or the hottest day of summer—when steel softens and even the paint on it blisters—neither affects in any way the nature-grown, fibrous resiliency of those straight grained hickory bars. Nor is there any chance for error as nature does the tempering and each of the millions of individual fibers is always ready to offer its individual resistance to every shock.

Not only superlative strength but extreme lightness in weight is achieved by use of these hickory bars. The Hays Hickory Hitter weighs only from one-third to one-half as much as serviceable steel or iron bumpers, thus lessening greatly the wear on car and tires.

Improved, Patented Fittings have been designed for both front and rear bumpers. They are simple, rigid and strong and attach the Hays Hickory Hitter to any car with an unrelenting grip that can not be shaken, or torn loose. Yet no

drilling is necessary. Their strength is excessive, still they too, are extremely light in weight.

These new fittings, together with springs of the finest crucible steel and massive cast brass bar clips are worthy companions of the fine hickory bumper bars. The whole is a bumper for which a "for the life of your car" guarantee is most reasonable. And the J. M. Hays Wood Products Co., a concern of 45 years' experience and leadership in manufacture of wood and metal products, guarantee the Hays Hickory Hitter against breakage from any cause whatsoever, for the life of the car to which it is attached.

Dealers: There is no bumper which you can handle with so much satisfaction and profit as the Hays Hickory Hitter. It makes friends for itself and for dealers wherever it goes. One Hays Hickory Hitter on the street means fifty more sales. Write for catalogue and the name of our jobber in your territory, also for our contract plan of sales to dealers.

Jobbers: Desirable territory is still open. Write for details.

HAYS HICKORY HITTER

Guaranteed for life of your car

Double Bar Type
\$18.00

Weights 27 pounds

"Junior" Double Bar Type
\$15.50

Weights 20 pounds

Single Bar Type
\$12.50

Weights 18 pounds

The "Junior" is a double bar type Hays Hickory Hitter made especially for Fords, Chevrolets, Star Cars, etc.

J. M. Hays Wood Products Company

A Division of the Standard Crate & Filler Co.

JEFFERSON CITY, MO.

ELWOOD HAYNES, PRES.
C.C. CARTWRIGHT, VICE PRES.

ALTON G. SEIBERLING, VICE PRES.

A. E. STARBUCK, SECY. & TREAS.
MARCH HAYNES, ASST. SECY. & TREAS.

THE HAYNES AUTOMOBILE COMPANY

MANUFACTURERS OF
HAYNES
MOTOR CARS

ADDRESS ALL COMMUNICATIONS
TO THE COMPANY

KOKOMO, IND.

Mr. Automobile Dealer:

I refuse to believe it.

I positively decline to believe that your silence means that you are absolutely satisfied with your 1923 automobile business and don't want to make 50% to 200% more profit in 1924.

You have received my letters and read them. The reason you have not answered, nor come to Kokomo to talk with me personally, is because I have not done justice to the Haynes Merchandising Plan.

I have failed in my attempt to briefly outline what it will do for you in boosting your sales and profits, and I have not been able to impress you with the CERTAINTY of it.

I confess that I am a pretty punk letter writer.

BUT WE HAVE a Merchandising Plan, which when backing up the Haynes car, positively cannot fail to jump your sales ahead, assure you better deals, cut down the cost of doing business, add tremendously to your net bankable profits.

If I could only get this thought across with you, I know you'd be interested and would come and call on me without further delay.

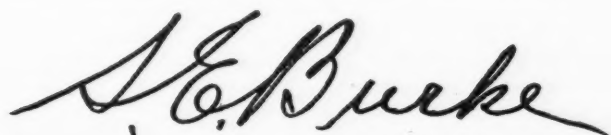
I am still hoping I can get it across. That's why I am writing you this message.

Are my efforts a fizzle?

Wire for the plan.

Yours hopefully,

THE HAYNES AUTOMOBILE COMPANY,



General Sales & Advertising Manager.

Flatlite

A

flatlite is
patented in
17 foreign
countries and the
United States



*flatlite is sold as a reflector for
replacement on present headla m*

plain glass lens and a **flatlite** reflector

*Make a headlamp that is
legal in all states and
a whirlwind seller*

The car owner is sick and tired of "bottled up" light in his headlamps. Special lenses may satisfy some law makers but all car owners are agreed that they do cut down the light.

Flatlite reflectors do everything any patented lens can do with no light reduction because the light rays are controlled and projected by the patented stripes and corrugations of this silvered reflector through plain, clear glass lenses. And there can be no glare from a properly focused *flatlite* reflector.

Cash in on the general objection to the "bottled up" light in the 13,000,000 pairs of headlamps now in use.

Every car owner in your city

or town or territory is a *flatlite* prospect. Some dealer must supply them and make money. It might as well be you.

Every customer you now have needs only to be shown to be sold.

Flatlite, too, will make many new customers for you.

Get behind this proposition just as strongly as you can—it will pay you well.

**The American
Flatlite Company**

1100 Gilbert Avenue
Cincinnati, Ohio

Mail Your Coupon TODAY
—NOW—or wire for full particulars.

flatlite

headlamps complete
and *flatlite* reflectors
now being produced
at the rate of 2500
per day.

**Your
Coupon**

Sign—tear off—mail—TODAY

The
American
Flatlite Co.

1100 Gilbert Avenue
Cincinnati, Ohio

Gentlemen:

Send complete information about
the *Flatlite* proposition.

Name.....

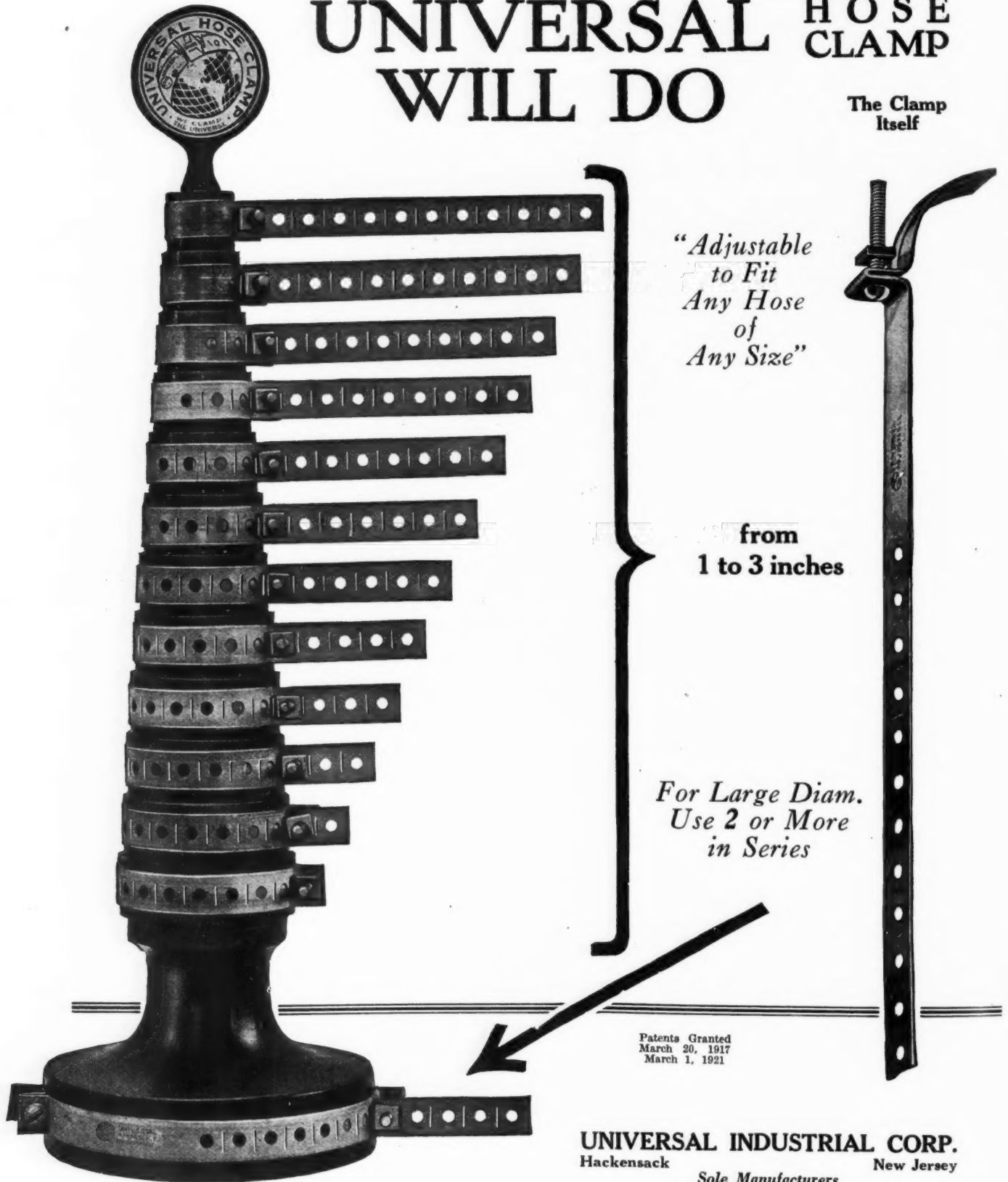
Address.....

or as a
headlamp
complete

or
a
mps

This Shows What One UNIVERSAL HOSE CLAMP WILL DO

The Clamp
Itself



Patents Granted
March 20, 1917
March 1, 1921

UNIVERSAL INDUSTRIAL CORP.
Hackensack New Jersey

Sole Manufacturers
DEPARTMENT OF SALES

LOS ANGELES
Roland Boreham
600 Metropolitan
Bldg.

CHICAGO
F. C. West Corp.
616 S. Michigan Ave.

PHILADELPHIA
T. Scott Eavenson
1533 Cherry St.

BOSTON
Burton Rogers Co.
755 Boylston St.

DALLAS
Harry Knight
2218 Commerce St.

© 1922 UNIVERSAL INDUSTRIAL CORPORATION

We also make a Junior size for small diameters that
fits all hose from $\frac{1}{4}$ to $1\frac{1}{2}$ inches.

Here's the strongest proof of



Quality..Dependability..Saleability

Read these messages from actual users

"Answering your letter regarding Sav-Oil rings will say that they **absolutely** do **everything** you claim for them.

"Since receiving our trial set, we have purchased six or **eight dozen rings** from your representative, _____, _____, and in every motor in which we have installed the rings they have **proven satisfactory.**"

"The car has been driven 350 miles since placing the rings and has used a little less than **one quart** of oil for that distance, which means that it will easily do a **thousand miles** on **three quarts** of oil, or considerable more mileage than your guarantee calls for.

"Considering the fact that this car would do only **200 miles** to the **gallon** before placing the Sav-Oil Rings, I think this record is remarkable."

You too can obtain results as good or better from Sav-Oil rings. You and your customers both will become enthusiastic boosters for these guaranteed oil rings.

Send now for an assortment of sizes (one per piston). Extra dollars of profits will be sure to follow.

Territories Open for Distributors

The Sav-Oil Ring Mfg. Co.

1037 So. Figueroa St.

Los Angeles

Sav-Oil Piston Ring Co.
2056 Jackson Blvd.
Chicago, Illinois

Sav-Oil Ring Mfg. Co.
550 Golden Gate Ave.
San Francisco, Cal.

H. C. Alexandria
612 W. Seventh St.
Little Rock, Ark.

H. W. Blevins
1532 Grand Ave.
Kansas City, Mo.

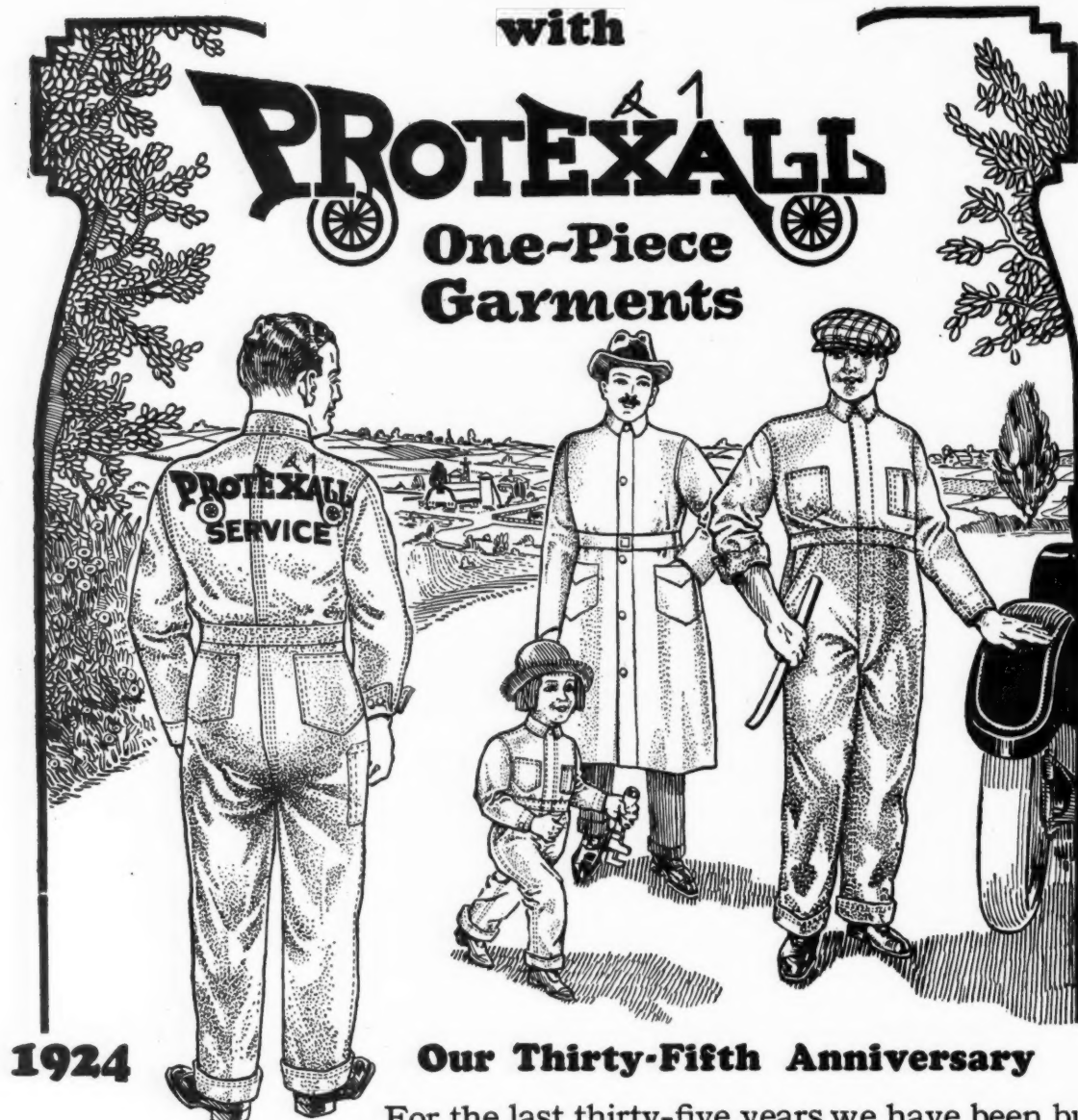
C. H. Mountjoy & Co.
211 Third Street
San Antonio, Texas

More Profits in 1924

with

PROTEXALL

One-Piece Garments



1924

Our Thirty-Fifth Anniversary

For the last thirty-five years we have been building quality garments and our years of experience have made us experts in our line. Protexalls are the best garments that can be built for the price.

Our Line Complete

We offer a complete line of several grades of garments in Blue, Khaki, White and Stripes. The material and workmanship are of the finest. We have a special lettering service that will interest you. Ask your jobber.

Exceptional Service Features

1. SPECIAL LETTERING SERVICE.
(Prompt Delivery)
2. DUST-PROOF CARTONS.
3. INDIVIDUAL PACKAGES.
4. DROP SHIPMENTS TO CUSTOMERS.
5. PROMPT DELIVERIES FROM SIX FACTORIES.
6. WESTERN BRANCH FOR STOCK AND LETTERING.
7. HIGHEST FINANCIAL RESPONSIBILITY.

Sold Only Through Jobbers

THE PROTEXALL COMPANY

100 Pearl St., Abingdon, Ill. — Est. 1889
60 Federal Street, San Francisco, Calif.

The Guaranty Yellow Is on the Band



“—same service as a new armature”

Note how definite our guaranty is. Nothing is left to the imagination. We state in plain words that every armature rewound by us is guaranteed to give the same service as a new one. Nothing could be plainer or fairer than that. The responsibility is all ours. YOU are asked to take no chances at all.

After years of specializing in this particular field the quality of our work is of such a high character that we are not taking any great risks by issuing such a guaranty. Expert automotive electricians do the work and the finest equipment and materials are at their disposal. A strict system of inspection makes quality workmanship doubly certain.

Our stock of rewound armatures for exchange purposes is over 6,000. We ship from this stock the same day defective armatures are received. Or if you prefer we will rewind the exact cores you send and return them to you.

At this time of year it's a good plan to send in the defective armatures you have on hand so you will be prepared to give real winter service.

PRICES

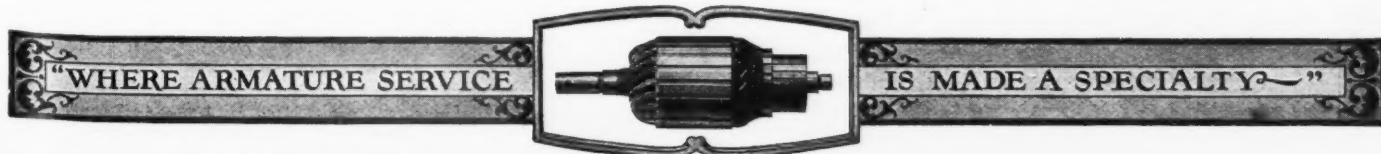
Ford Armature
Rewound, \$2.00

Any Two Unit
Generator
Armature
Rewound, \$5.00

U. S. AUTO SUPPLY CO.

Armature Service Division

3845 S. Wabash Ave., Chicago



INSHIELD

TRADE MARK REGISTERED U.S. PAT. OFF.

DRIVING LIGHT

There is nothing like it!



Patented Oct. 30, 1923

**INSIDE THE
WINDSHIELD**
NO GLASS TO CUT

INSHIELD SENIOR

Heavy, polished, nickel finish $5\frac{1}{2}$ " in diameter. The big driving light for the big cars. **\$10.00**

INSHIELD "8"

Furnished in nickel or baked-on black enamel. $4\frac{1}{2}$ " in diameter. A beautiful light that fits all cars and all purses. **\$7.50**

The windshield is never endangered, either in the attachment of an Inshield or in the use of it. Inshield driving lights never rattle or stick.

Genuine Inshields Made Only by

**THE INSHIELD
PRODUCTS COMPANY**

Department 8
TOLEDO, OHIO

Formerly the Thal & Bitter Machine Co.

NO other light in the market today offers to jobber, dealer and car owner the advantages that are exclusive with the Inshield driving light.

It's all inside the windshield—there is no glass to cut. It's easily attached—no special tools needed. Can be placed anywhere on the windshield. Swings with the windshield to any position, and can be pointed at any angle under any and

all conditions. Detached in a jiffy for trouble use.

No other light at any price offers more quality in material and workmanship. Sheet brass, heavily nicked or enameled. Genuine silver reflector. Twenty-one candle power Mazda precision tipless bulb. Nothing to take apart to change bulb or lens. Sold through recognized jobbers only. Absolutely guaranteed.



This is
INSHIELD "8"

\$7.50

INSHIELD PRODUCTS CO.
Toledo, Ohio.

Please send full information about the Inshield Driving Lights.

Name

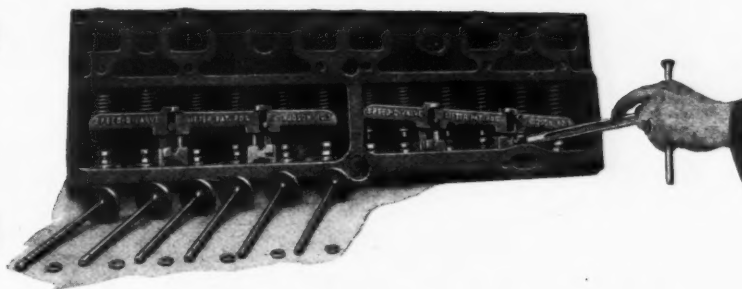
Address

City State.....

My jobber is

SPEED-O MULTIPLE VALVE SPRING LIFTER

Lifts 4 to 12 Valve Springs in Less Than 30 Seconds



THE IMPROVED 1924 SPEED-O VALVE LIFTERS

No.	Order by the Numbers	
1.	Ford	\$2.25
2.	Lincoln	10.00
3.	Dodge	5.00
4.	Jordan	5.00
5.	Maxwell	7.00
6.	Continental—Fits All 7R and 8R Motors.....	12.00
7.	Hudson	8.00
8.	Cadillac	10.00
9.	Studebaker—Fits Special and Big Six.....	
10.	Packard—Single Six	
11.	Packard—Straight Eight	

Trade Mark Reg. U. S. Patent Office
Patented and Pat. Pdg.

Speed-O in the Service Station

Speed-O Valve Lifters have been developed with the idea of placing in the hands of service station mechanics a new tool that enables them to do a profitable service operation with greater ease and comfort to themselves, and a greater return in profits to the service and repair shop operator.

Speed-O makes it possible for a mechanic to remove and replace a set of valves ten to twenty times faster than any other method. No more handling one spring at a time.

Figure out for yourself the saving in time, the increase in profit, and the satisfaction from your customers' point of view in a good job, well done, at a more moderate cost.

You do a lot of valve grinding and it's a profitable service operation. Why continue in the old way, when Speed-O sets a new pace and makes possible a saving in time and labor.

Place one or two multiple valve spring lifters in your shop and watch the results. Your time cards will show the difference in time-saving, your costs in profit-making.

Get a Speed-O Valve Spring Lifter from your dealer today. You'll be surprised how little it costs and how much it saves.

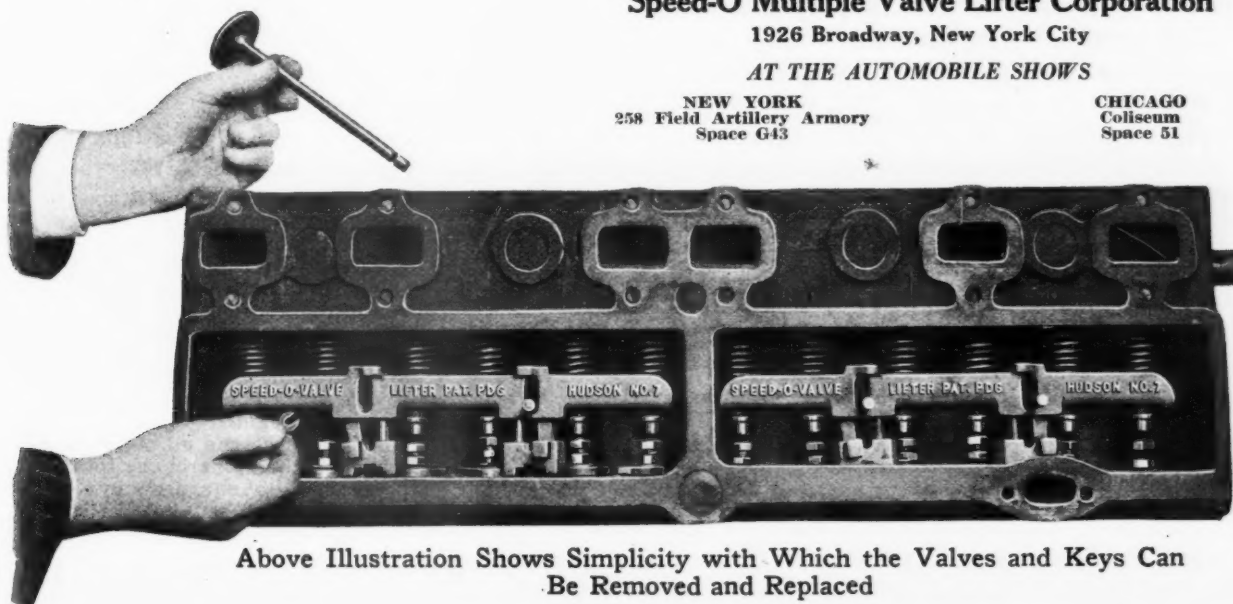
Speed-O Multiple Valve Lifter Corporation

1926 Broadway, New York City

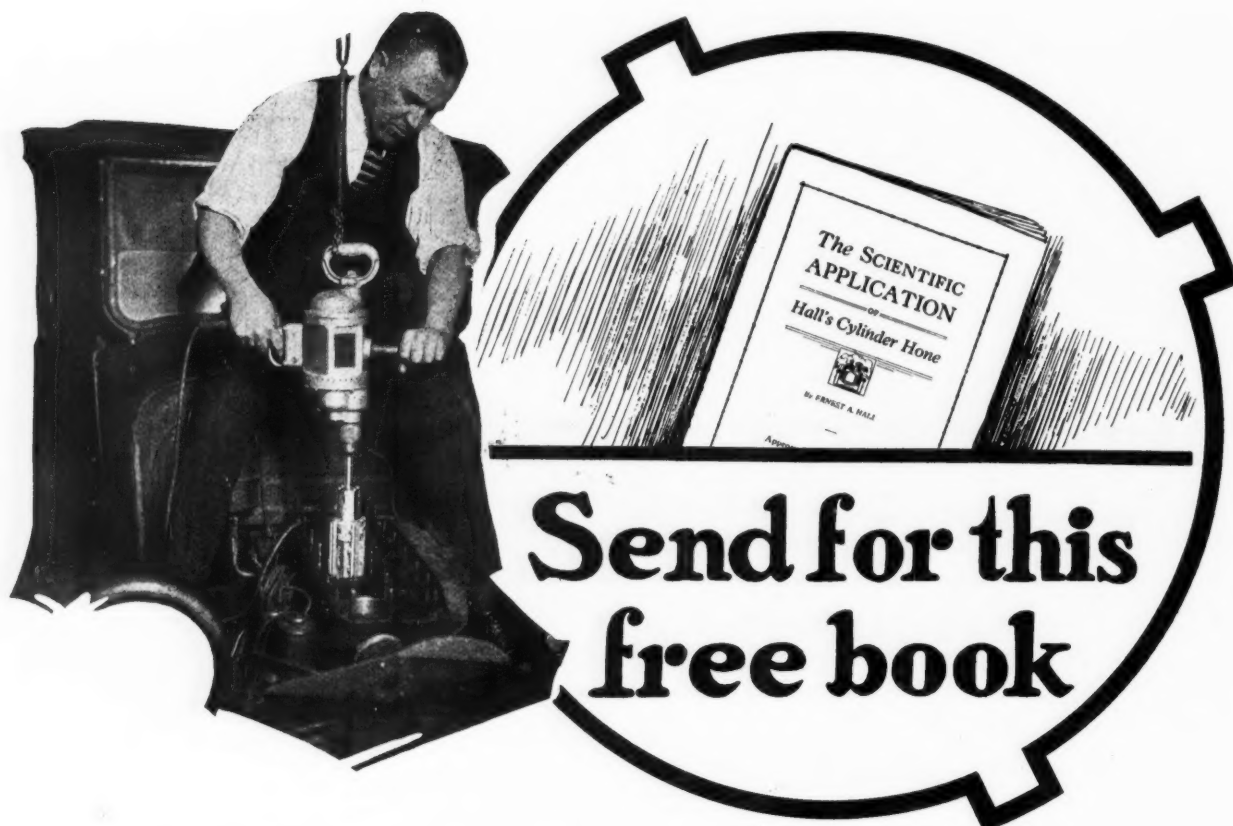
AT THE AUTOMOBILE SHOWS

NEW YORK
258 Field Artillery Armory
Space G43

CHICAGO
Coliseum
Space 51



Above Illustration Shows Simplicity with Which the Valves and Keys Can Be Removed and Replaced



**Send for this
free book**

Get the Facts on Honing —and the Profits

You are interested in getting more business by doing better work—a bigger range of work and a satisfied patronage.

You want to make money and you may have the flat rate system to deal with.

If your shop is not now equipped with facilities for resizing cylinders you can do so at a cost of only \$50. Three Dodge jobs will pay for a Hall Cylinder Hone.

The Hall Cylinder Hone and the Hall method of honing have been endorsed and recommended by leading automotive engineers. Buick for example has recommended it for use in all its service stations.

Recommendations such as these are



But get the details—our free booklet makes all these points clear.

THE HALL CYLINDER HONE CO.

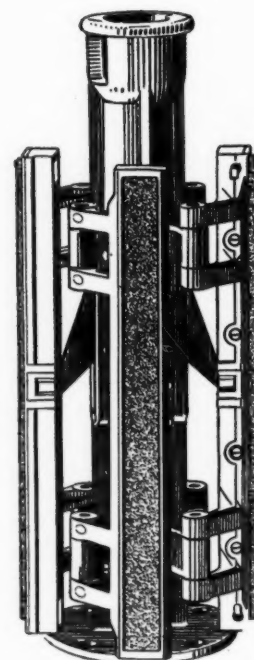
435 DORR STREET

TOLEDO, OHIO

In Canada : : HALL GEAR & MACHINE CO., Toronto, Ontario

made because honing is better for the motor. The walls of a cylinder become hardened or seasoned in service, an asset to the life of the motor which is not entirely removed by honing. Grinding or re-boring usually removes this valuable metal and exposes a fresh loose grain texture which is subject to rapid wear.

Then honing is a most important time saving method also. The work is done on the chassis and a time charge for taking down and remounting this motor is eliminated. It makes the flat rate profitable for you and the charge reasonable for the owner.



Parallel Expansion of Stones

The expansion in the Hall Hone is controlled by one spring in the center of the hone body. Each stone receives an equal pressure to an equal distance. Each stone is rigidly hinged at top and bottom to prevent tipping or following a tapered cylinder. By soaking stones in kerosene all cuttings remain on the stone in the form of paste and do not drop into the motor bearings.

the seasoned metal is but skin deep—don't waste it

Rebuilding Motors Pays Biggest Profits



A C-O Universal Motor Stand speeds up Motor Rebuilding. It is one of the reasons Fuchs-Elrod make big profits on this work.

The biggest profits in Motor Service work today, are in Rebuilding Motors.

The shop which is not equipped to completely rebuild a motor, puts profits in the other fellow's pockets.

An analysis of profits proves the big money for the dealer is in motor service and that car sales go to the dealer who has service equipment. The service staff of most large car manufacturers is greater than their sales staff, an indication of the importance of service.

Are You Equipped?

Don't blame your car owners for patronizing shops better equipped than your own.

You would do the same thing yourself. Car owners want a complete job at a reasonable price. Complete motor re-building equipment is the only answer.

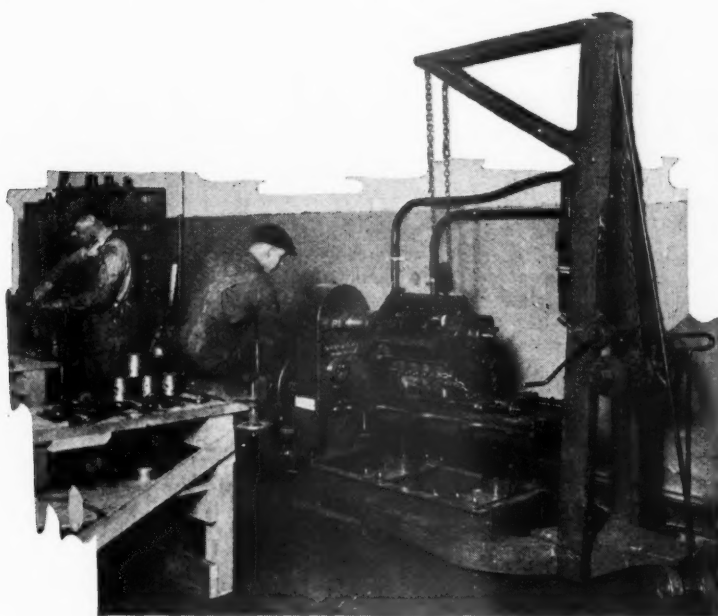
C-O Shop Equipment Pays

Canedy-Otto Mfg. Co., is older than the Automobile Industry. It has developed much of the shop equipment which makes Motor Re-building possible and profitable.

Canedy-Otto Service Station equipment is standardized and approved by the following manufacturers: The Studebaker Corporation of America; Buick Motor Company; Nordyke & Marmon Company; Jordan Motor Car Company.

C-O Equipment puts your shop in a position to turn out the finest work, in the shortest time, at the greatest profit. That's a fact which thousands of prosperous shop owners will testify.

Make us prove it. Write today for Bulletin, illustrating complete shop equipment.



Running-in bearings on an Olds 8 motor with a C-O Running-in and Burning-in Machine.

Fuchs-Elrod, Omaha, believe in complete, modern equipment—so they use a C-O Floor Crane to move motors and heavy parts.

CANEDY-OTTO MFG. CO.

CHICAGO HEIGHTS, ILL.

Complete Stock Carried in Branches at

952 Folsom St., San Francisco, Calif.

407 Broome St., New York, N. Y.

AGAIN in 1924

ROSE

Will Lead in Tire Pump Sales

For nine years the Rose has been America's leading tire pump.

More Rose Tire Pumps were sold in 1923 than all other makes combined.

The Rose is sold by more jobbers and dealers than any other make.

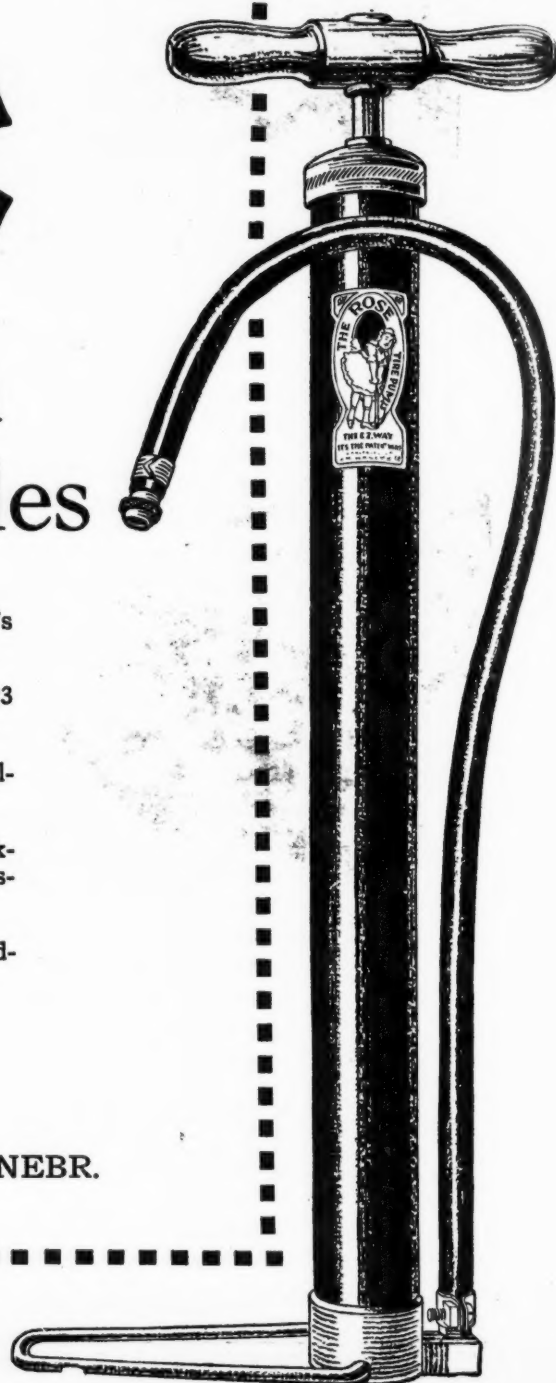
To the public the Rose represents a remarkable value. The world's easiest pump at reasonable price, backed by a 5-year guarantee.

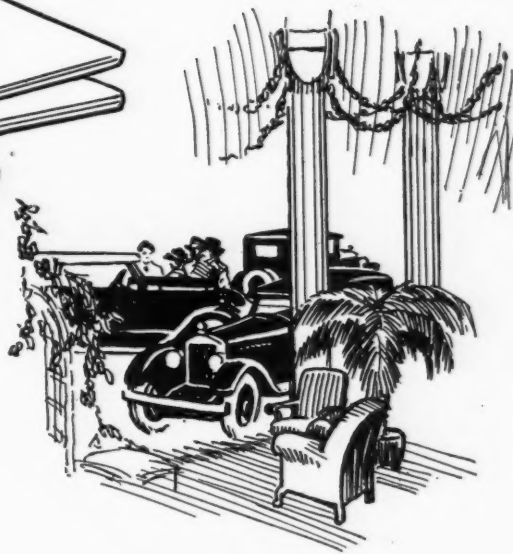
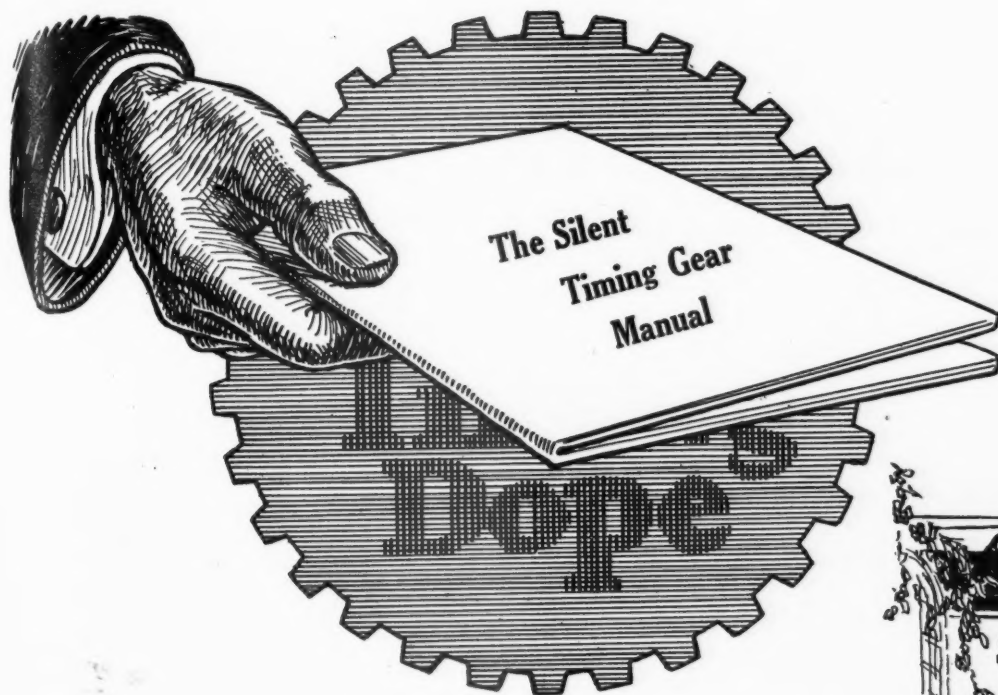
To jobber and dealer it is the most dependable profit item in the tire pump field.

INCH AND A QUARTER, \$2.50

INCH AND A HALF, \$3.00

FRANK ROSE MFG. CO., HASTINGS, NEBR.





Here Is the Data You've Wanted!

All there is to know about timing gears; data on all cars, sizes, prices, instructions for installing, kinks and shortcuts that make money for you. It will be handed to you free, at the shows!

No book with so much useful information, so many ways of getting more money out of timing gear sales, has ever been written. You'll be the loser if you leave the Armory or the Coliseum without one, or if you fail to take along one of our Miniature D. & B. Gears, for examination.

There will be exhibits of D. & B. Gears with hundreds of thousands of miles in their history, running as silently as when new.

Important Announcements Coming

Within the next month we shall make announcements that will be of greatest importance to the trade. They will affect your activities in handling gears in a most pleasant and profitable way. It will be worth your while to watch for them.

Scribble a note on the cuff of the shirt you'll wear to the show—"Call at D. & B. exhibit."

At the Show

NEW YORK

Spaces 191-192
258th Field Artillery
Armory,
Also D. S. F. Co.
Spaces 201-202
Jan. 5 to 12.

CHICAGO

Spaces 94-95
Coliseum Balcony,
opposite main entrance,
Jan. 26 to Feb. 2.



(The Original)
SILENT
TIMING GEARS
of Celeron

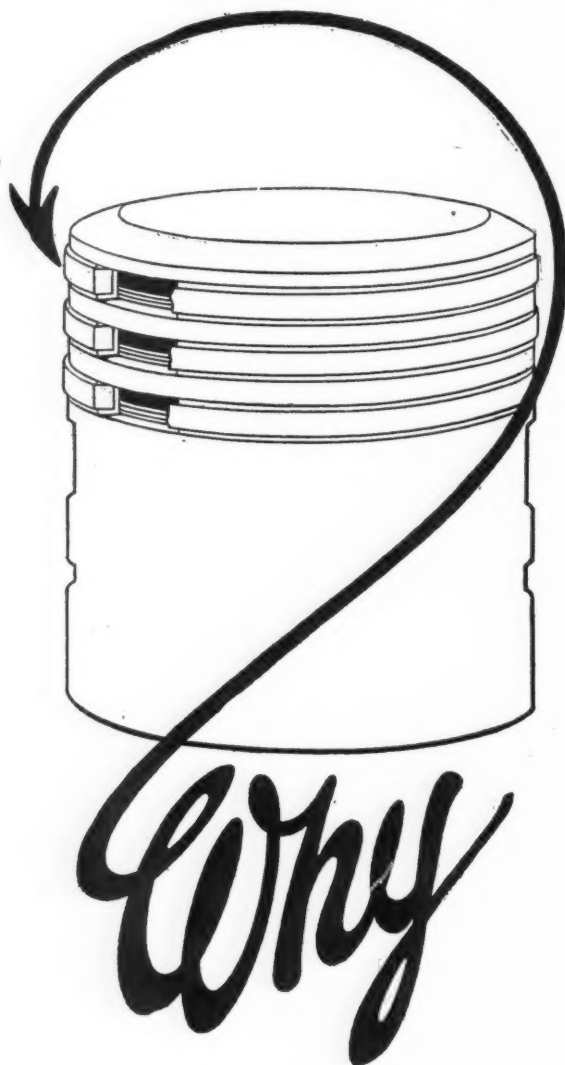


2333 MICHIGAN BLVD.

CHICAGO, ILLINOIS

Member of the American Gear Manufacturers' Association

Creates Power Through Reduced Friction



THE Velvet Seal Piston Ring overcomes friction caused by excessive wall pressure required to make the ordinary hard metal ring seat itself properly against an equally hard cylinder wall.

The white metal insert in the Velvet Seal Piston Ring is softer than the cast iron surface of the cylinder wall—yet it has exceptional wearing qualities and is anti-frictional.

The cylinder is sealed against compression leaks and oil pumping. Constant tight-fitting-anti-frictional qualities of the Velvet Seal ring provide, at all times, minimum of friction with maximum of power.

Velvet Seal Piston Rings are scientifically constructed of the finest materials under high standards of workmanship—and they cost no more than other rings.

Big profit possibilities for all Dealers and Jobbers. Cash in on this product that is alive with money-making opportunities. Today is the day to write.

The white metal insert—a composition not as hard as cast iron—has great ductility and exceptional wearing qualities. Its ductility allows it to quickly conform to the surface of the cylinder wall and it promptly adjusts itself to any minor inaccuracies or variations that may exist.

This sealing process eliminates compression leaks and oil pumping. In addition the anti-friction qualities of the metal insert reduce heat—lengthen the life of the ring—and preserve the wall of the cylinder.

The result is minimum friction—better compression—longer life—more power.

The Velvet Seal Piston Ring Co.
Cleveland, Ohio



The
Ring
With the
Silver Band

Velvet-Seal PISTON RINGS

It's the Silver Band that Stops the Leaks



Hello—How's Things Brakin?

GEORGE WILLETS who runs a garage out in Eastern Ohio writes in suggesting a trade figure for Testbestos.

George says in his letter "make this gink just a big 13 with a grinning face on it and some arms and then use a horseshoe for legs"

George's idea is that the Testbestos Assortment of 13 sizes, with which 90 per cent of all brake lining jobs can be handled, is worth featuring strong.

Well it is—and here's the trade figure. All right George?

But this 13 assortment really does save a lot of grief. It cuts down the stock you have to carry. Saves tying up money in sizes little used and simplifies the whole proposition from start to finish.

Besides which when you put Testbestos on a car you're putting on the best brake lining money can buy—every foot of it guaranteed.

Try Testbestos at our risk—if you don't know our nearest jobber — use the coupon.

American Asbestos Co.
Norristown, Pa.

The Lucky 13

These 13 sizes of TESTBESTOS are all you need carry in stock to take care of 90 percent of your relining jobs. Your jobber can supply other sizes promptly.

For
1-1/8 x 5/32, Fords
1-1/4 x 5/32
1-1/4 x 3/16
1-1/2 x 5/32
1-1/2 x 3/16
1-3/4 x 3/16
2 x 5/32
2 x 3/16
2-1/4 x 3/16
2-1/4 x 1/4
2-1/2 x 1/4
3 x 1/4
2 x 1/4

REG. U.S. PAT. OFF.
TESTBESTOS
AUTOMOBILE
BRAKE LINING



AMERICAN ASBESTOS COMPANY
Norristown, Pa.

Please send me the name of the nearest TESTBESTOS jobber.

Name

Address

A Complete Line of Electrical Testing Equipment for Service Stations

FOR 1924

HOYT ROTARY METER AND SHUNT—a serviceable 6-range voltmeter for finding grounds, shorts, open circuits, poor connections—also field, armature and battery troubles. Small enough to slip into your pocket.\$25.00

HOYT CELL TESTER — an instrument needed by every service man—gives immediate comparative check on the individual cells of any battery and thus measures the work that battery can perform.....\$11.00

HOYT CADMIUM METER and PRODS—for use in Battery Service Stations to prove condition of plates during charge.....\$17.50

HOYT GROWLER METER and CONTACTOR—to be used in conjunction with any growler to make possible the complete testing of any armature.....\$19.00

HOYT PORTABLE MAGNETOMETER—an instrument designed for testing the condition of Ford magnetos.....\$10.00

HEYER IGNITION TESTER—a complete outfit built up in units so that customer may purchase: A variable speed drive for generator testing and a complete portable ignition tester, special design as he needs them, or he may purchase the equipment complete.....\$420.00

HEYER BATTERY CHARGERS—built in different units, for handling the requirements of service stations of varying size—price depends on capacity, voltage and frequencies.

MIHO BATTERY TEST EQUIPMENT

Model A—for complete discharge and other tests\$53.50*
Model B—for breakdown test only..... 39.00*
Model C—for low rate discharge and cycling 33.00*

MIHO ELECTRIC BATTERY OPENER—will open batteries quickly and cleanly at low cost\$28.00*

MIHO GROWLERS—two types: one equipped with meter, rheostat and special contact fingers—the other, the plain growler without appurtenances\$40.00

MIHO FORD COIL TESTER—a small portable tester for use with 6 volt storage battery..\$7.50

*Price—East of Rocky Mountains

All of this equipment is distributed to the service station thru legitimate wholesalers with the assistance of technically trained field men whose business it is to understand the requirements of the trade. This company is also cooperating with the

SERVICE EQUIPMENT ASSOCIATES in an endeavor to build up the Service Stations and make it easier for them to learn of, and obtain standard equipment through their jobbers.

FREE BOOKLETS—a request on your business letterhead will bring any one or all of the following educational pamphlets:

"Hunting Down Electrical Troubles."
"The Cadmium Test."
"Growler Chart."
"Rectifier Questionnaire."
"Miho Chart" (showing various battery tests.)

Burton-Rogers Company

26 Brighton Avenue, Boston

Branch offices and Distributors in all principal cities.

**"The Best-Equipped Shop
Gets the Business"**



Detroit Tire Lock



Lock Unit Yale or
Corbin Type



\$5.00
Retail

Chosen as standard equip-
ment on some of America's
most popular cars.

AMERICA'S FINEST LOCK

Since the introduction of the Detroit Tire Lock three years ago you have seen it as standard equipment on several of America's finest cars.

Its popularity has made it imperative that the manufacturers distribute the Detroit Tire Lock through the regular trade channels inasmuch as it can be instantly installed on practically every automobile equipped with a ring type tire carrier.

DETROIT TIRE LOCK

- insures the safety of the spare tire.
- is equipped with a Corbin or Yale type cylinder.
- is instantly installed.
- is adaptable also for a second spare tire.
- is not affected by dust or water.
- is produced by one of the industry's leading manufacturers.

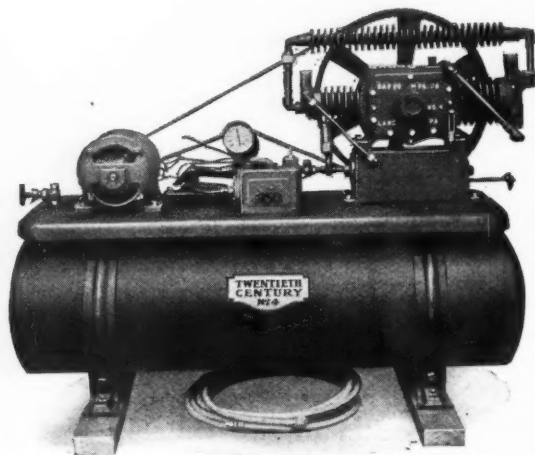
Territories are being rapidly allotted.
The generous discounts will appeal to you.

*Write today for our merchandising plan and copy
of striking Catalogue Insert.*

Detroit Carrier & Mfg. Co.
DETROIT, MICHIGAN

TWENTIETH CENTURY AIR COMPRESSOR

Gasco Two Stage 20th Century Air Compressors



Delivers a greater amount of air at high pressure with less effort and less expense.

Users say it is the quietest and smoothest running compressor on the market.

Assures cool and pure filtered air.

Is equipped with a perfect belt idler—keeping belt tight at all times.

Safety valve is guaranteed to function with the accuracy of a steam valve.

Automatic electric control and unloader is of improved type and works with any current.

Furnished with 25 ft. high grade air hose, needle valve and chuck.

SPECIFICATIONS

Type	Capacity	Motor	R.P.M.	Tank
No. 4	4 cu. ft. per min.	1/2 H.P.	250	35 gal.
No. 5	6 cu. ft. per min.	1 H.P.	300	35 gal.
No. 6	12 cu. ft. per min.	2 H.P.	250	60 gal.

WATCH FOR NEW SINGLE STAGE COMPRESSOR AT THE NEW YORK SHOW

Gasco Air and Water Service

Gasco Air and Water Station



Patent Applied for

Gasco Air and Water Station is the latest and most modern form of complete Air and Water Stations. In symmetry of line and ornamental construction it is considered an attainment. Due to these facts it should be permissible on the curb in all cities.

Inside illumination makes sign attract at night as well as day. Equipped with 30 feet of high grade air hose, 22 feet for use; returns to station automatically; 8 feet of water hose with best grade self closing faucet.

Built to OPERATE ALWAYS, under hardest usage and to LAST under severest conditions.

Junior Gasco Air and Water Station



Patent Applied for

Junior Gasco Air and Water Station meets all demand for a less expensive Air and Water Station, both attractive in design and permanent in construction.

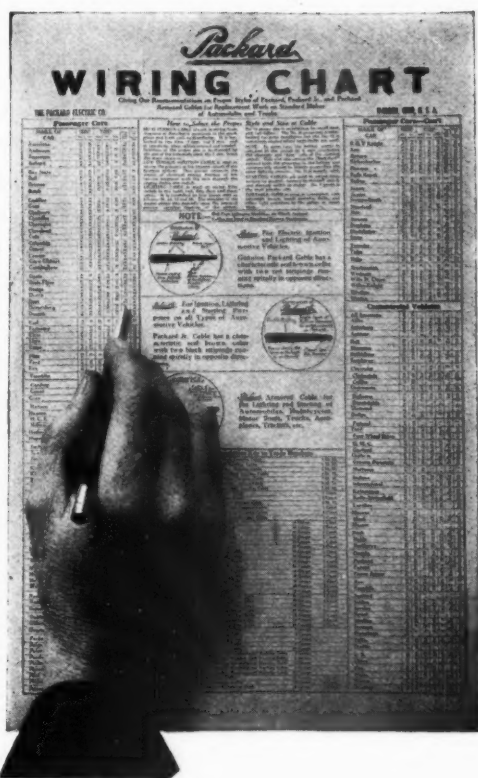
Can be furnished with illuminated globe or grey iron day sign for slight difference in price. Equipped with 30 feet high grade air hose, 22 feet for use; returns to station automatically; 8 feet of water hose with best grade self closing faucet.

Always operates and is built to resist deterioration. Encasement of heavy wrought iron pipe; cap and base of grey iron. Can be taken apart and assembled in 20 minutes.

GASCO MANUFACTURING COMPANY

General Sales Office
25 Church Street, Room 912, N. Y. C.

Plant Located at
Lancaster, Penna.



If you don't already have a Packard Wiring Chart, mail that coupon to us Today.

A Constructive Help When You "Fix 'er Up"

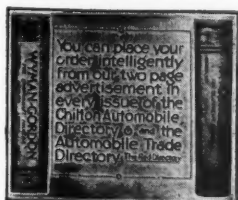
Whether you are rewiring car or truck, simply refer to the alphabetical list on the Packard Chart and after the car name you find the proper high or low tension ignition cables; the proper lighting cable for head lamps, tail lamps or other lamps; the battery and starter cable, and the generator to battery cable.

Out of a total of 162 cars and trucks, Packard Cable is a standard specification for 116, hence in the majority of cases you will be replacing with the make of cable originally installed in the car.

The Packard wiring chart makes it easy, and Packard Cable assures satisfaction. It is a *unit of good repute*.

The Packard Electric Company

Warren, Ohio



(CATALOGED)
in the Red Directory

COUPON

The Packard Electric Co.
Warren, Ohio

Send me the FREE Wiring Chart as described in the Jan. 3 Issue of Motor Age.

Name.....

Address.....

City.....



$\frac{1}{2}$ Inch Special Drill \$58
Bench Drilling Stand \$24

Always ready to go!

The fact that Cincinnati Portable Electric Drills, Grinders and Buffers are trouble-proof and always ready to go, has made them for twenty-two years the most popular tools of their kind—has won them a world-wide standing with mechanics who know and want good tools.

They are well designed, to protect their vital parts, to keep out dirt and injurious substances, to stand years of use. An investment in a Cincinnati Portable Electric Tool is an investment in years of efficient service. You don't have to "baby" these tools. They are rugged, built to stand the hard knocks of real work.

The line is complete, including Portable Electric Drills, $\frac{1}{4}$ in. to $1\frac{1}{4}$ in. capacity; Grinders and Buffers, $\frac{1}{4}$ to 3 H. P. Catalog on request.

Sold by jobbers everywhere

The "Cincinnati Junior" $\frac{1}{4}$ In. Drill



Ball Bearing
Weight 5 lbs.

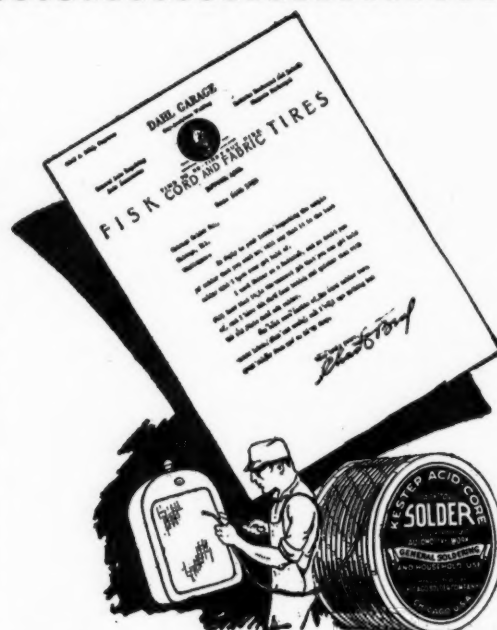
\$28

The Cincinnati Electrical Tool Co.
1515 Freeman Ave., Cincinnati, Ohio

New York, 50 Church St.; Philadelphia, 1220 Real Estate Trust Bldg.; Buffalo, 280 Carolina St.; Cleveland, 517 Bangor Bldg.

Standard since 1902

The Cincinnati
Electric Drills-Grinders-Buffers



"The Meanest Job"

Chas. A. Beal, proprietor of the Dahl Garage, is right when he says—here it is—read it yourself:

"I used Kester on a radiator, and no doubt, you will know that it is the meanest job that you can get hold of, and I have the work done better and quicker than with the old-style acid and solder. The acid cores inside of the wire solder sure saves labor, time and money, and I will use nothing but your solder from now on in my shop."

We all agree with him, a radiator is a mean job and he's found how to simplify soldering it—Kester does the work.

Sold by live dealers everywhere in one pound coils, in cartons, and on one, five and ten pound spools

Manufacturers

CHICAGO SOLDER COMPANY

4203 Wrightwood Avenue, Chicago

Direct Factory Representatives:

THE FAUCETTE HUSTON CO.
Chattanooga, Tenn.

LOUIS J. ZIESEL CO.
216 Market St.
San Francisco, Cal.

DAVIES-ELY CO.
66 W. Broadway
New York City

KESTER
Acid Core WIRE SOLDER



Requires Only Heat

The only one-piece ring that locks both edgewise and widthwise

EVERYDAY Piston Rings automatically expand to take up the wall wear yet are leak-proof at the joint. Their interlocking and overlapping joint seals tight against gas and oil leakage even when expansion takes place. Everyday piston Rings fit perfectly at the joint, edgewise as well as widthwise—the only one-piece ring with this feature.

Popular with good repairmen because they seat quickly. Lathe turning gives Everyday Rings a velvet-like surface.

Everyday Rings bring a profit that makes their handling very much worth while. Distributed exclusively through automotive Jobbers in all standard sizes from 2 inches up and oversizes .005, .010, .015, .020, .025, .030.

Everyday Piston Rings can be installed in less time than ordinarily required for such work. No fitting, filing or tedious work.

Write for our Extra Profit Sales Plan!

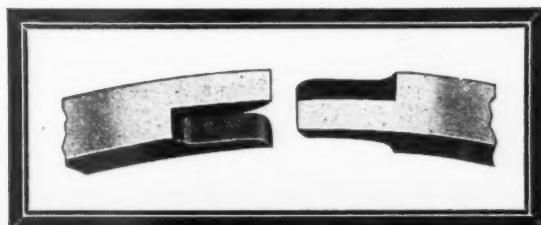
New Dealer Helps are now ready.

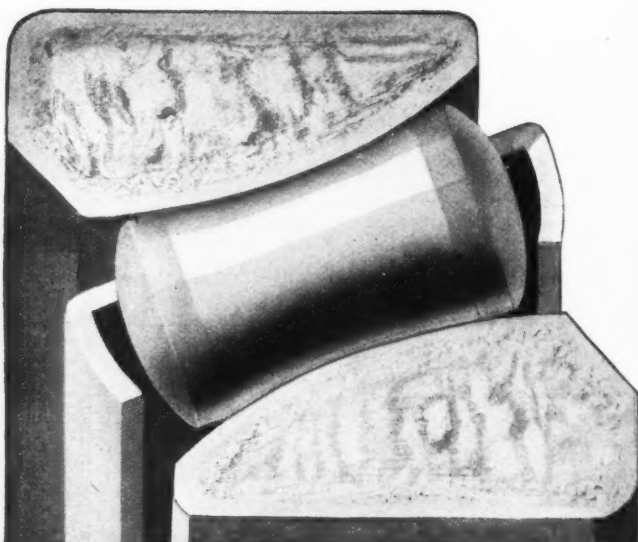
ROYAL PISTON RING COMPANY, INC.

BATH, NEW YORK

Sole manufacturers of Everyday and Perfect Everstep Piston Rings

EVERYDAY PISTON RINGS





SHAFER

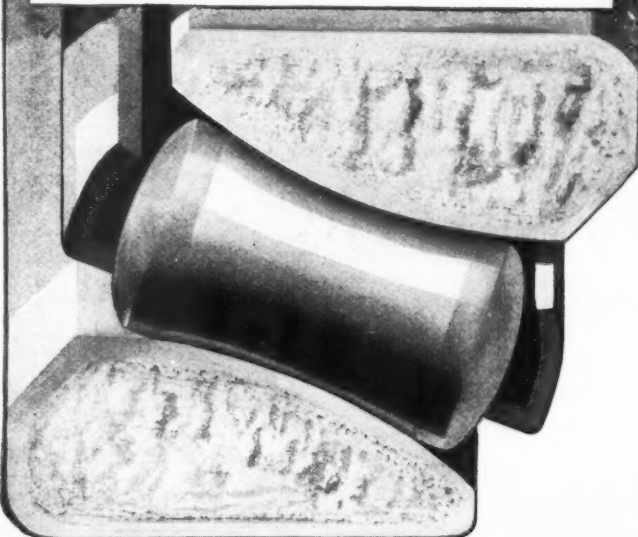
Self-Aligning ROLLER BEARING

PAT. & PATS. PENDING

SHAFER Roller Bearings are guaranteed to give satisfaction when properly assembled. They are capable of taking severe thrust and radial loads applied from any angle. They are full self-aligning to shaft deflections and adjustable for wear.

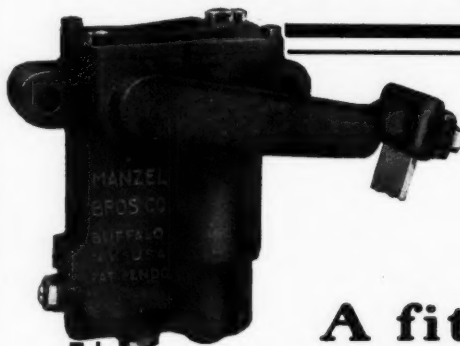
*Our new service catalogue
is now ready for distribution*

SHAHER BEARING CORPORATION
6501 WEST GRAND AVENUE
CHICAGO, ILL.



MANZEL

**HYDRAULIC
SHOCK ABSORBERS**



**A fitting
companion to
the car with 4
wheel brakes**

"Manzel" Shock Absorbers are as great a contribution to the riding comfort of the modern car as four wheel brakes are to its safety.

Their quick and never-failing hydraulic action will make any car glide along with boulevard comfort, even when traversing the rutty roads of the country.

They put an end to the bumps and jolts and sways that take so much pleasure out of motoring. Their patented, automatic valve control acts instantly in absorbing every rebound on a cushion of oil.

"Manzel" Hydraulic Shock Absorbers retain their efficiency indefinitely. A simple, sturdy construction leaves nothing to get out of order and they will last for the life of any car. Their quick and never-failing action takes up every road shock, no matter how bad the road, nor how rapid the speed.

And they do more than increase the comfort of riding. By absorbing each road shock, they prevent the excessive vibration that is ruinous to the motor and every other part of the motor car.

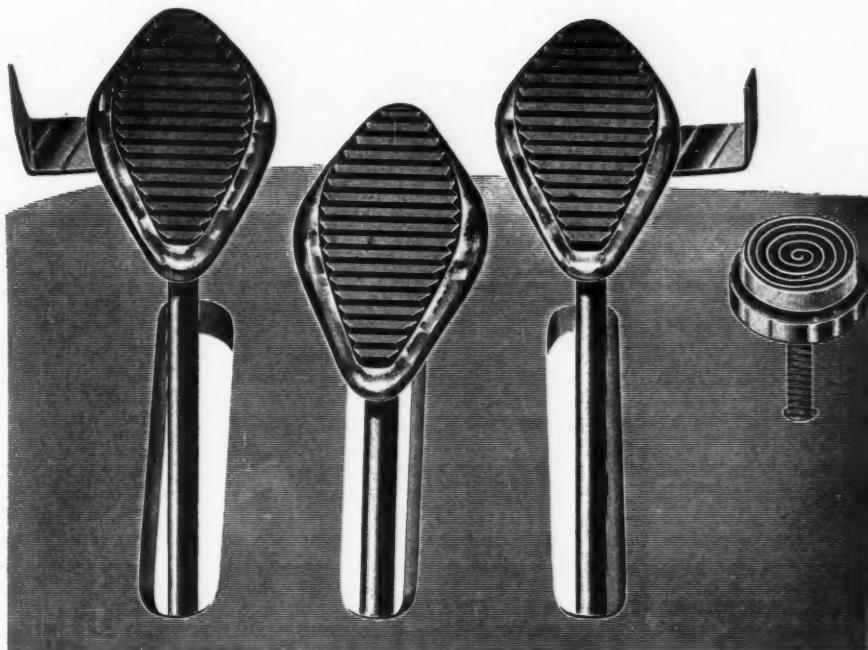
"Manzel" Shock Absorbers appeal to the buyer who can afford the best, yet their moderate cost makes prospects of nearly all owners.

Why not look into the advantage of having the "Manzel" agency in your town. Write for our sales plan now.

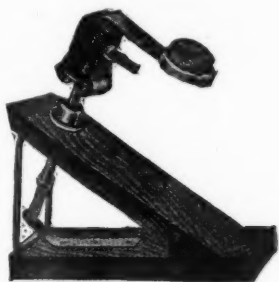
Manzel Brothers Company
306 Babcock Street
BUFFALO NEW YORK

The
New "D" Hook
for Ford Cars

\$1⁰⁰ per set



"Perfection" Pedal Pads



New Accelerator
Extension

Gives ease and comfort to driving. Brings the accelerator nearer the foot in ANY position. Prevents slipping. Rests the sole of the foot. Fits all cars and sells readily for \$2.00. A much needed utility.



This Display Board, Accelerator and Starter Pads, 12 assorted sizes, \$6.00

These pads are made in sizes to fit accelerator or starter for every make of car. Strong, well designed, heavy rubber pads set in a nickel frame. Makes control of the throttle easier and more certain. Price, 50c each.

A stock of only twelve sizes is all you need to equip any car made during this and the last *six years!*

There is a size for every make of car but *twelve* sizes will meet every day demands.

"Perfection" Pedal Pads comprise a line so complete that you can't miss a sale.

*Attached in a minute — No Bolts—
No Drilling—Just Bend the Prongs.*

Made from highest grade rubber. The upper surface is deeply corrugated, insuring a firm grip for the foot. The pad is firmly secured in a cold rolled steel frame, handsomely nicked.

Special discounts on quantity orders. Send for catalog today. Better still—order an assortment at once.

Manufactured exclusively by:

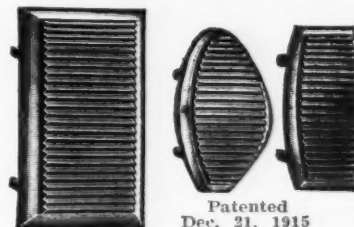
AUTO PEDAL PAD COMPANY

318-320 West 52nd St., New York City



Universal Extension
Pedal

This pedal fits every shape or type of automobile brake and clutch. It is invaluable for cars driven by several people, as it adjusts quickly to suit the individual driver. Price, \$5.00 per pair.



Patented
Dec. 21, 1915

Pierce-Arrow
Cadillac and Ford

From the lowest priced car to the highest you can satisfy your customers instantly with "Perfection" Pedal Pads. Have them handy. The demand is universal.

"Insist on the Pad with the Nickel Frame"

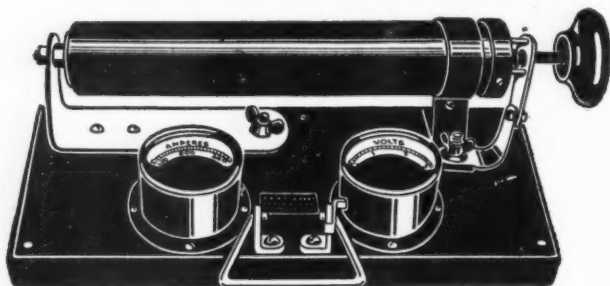


For Better Business in 1924

Use Profit-making Equipment

Your battery sales for 1924 can be greatly increased and you can give better service if your shop is equipped with modern battery-testing equipment. The Allen-Bradley Type L-2502 test set and the Allen-Bradley battery test chart eliminate guess work in battery service.

Be up-to-date and get the latest information on battery testing by sending the coupon, today.



Allen-Bradley

TYPE L-2502
HIGH-RATE DISCHARGE TEST SET

Allen-Bradley Co.

Electric Controlling Apparatus
281 Greenfield Ave.

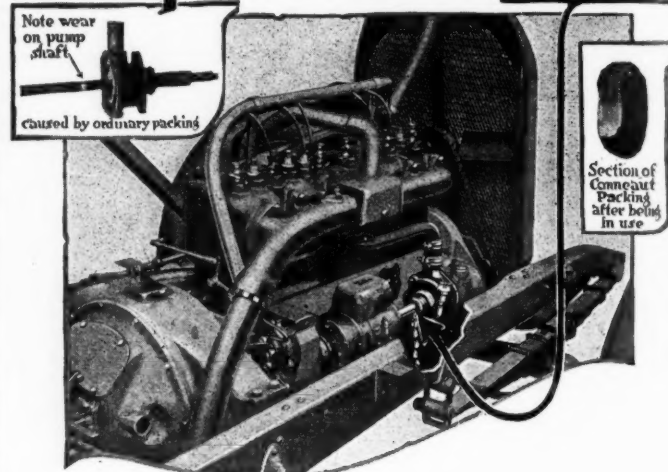
Milwaukee, Wis.

Please send us your latest bulletin on the Chart Method of Battery Testing and a reproduction, in color, of the test chart.

.....

.....

Stop That Leak



How to stop water pump leaks

Conneaut Plastic Metallic Packing eliminates once and for all the leaky water pump and seals pump shafts *tight* even after they have become worn and are difficult to hold with ordinary packing methods.

Conneaut Plastic Metallic Packing can be molded with the fingers to fit a stuffing box of any size. It makes a smooth, practically frictionless metal bearing—which you can adjust. A trial will convince you. Send for can today.

Jobbers!

There is no material you can handle with more satisfaction and profit than Conneaut Plastic Packing. The displaying of a sample by your salesmen will convince that there is a ready market for Conneaut Plastic Metallic Motor Engine water pump packing. A sale of this material to the garage man means repeat orders; it sells itself after the first sale and makes you friends. We furnish attractive display cartons and give selling assistance. Write us today for full information.

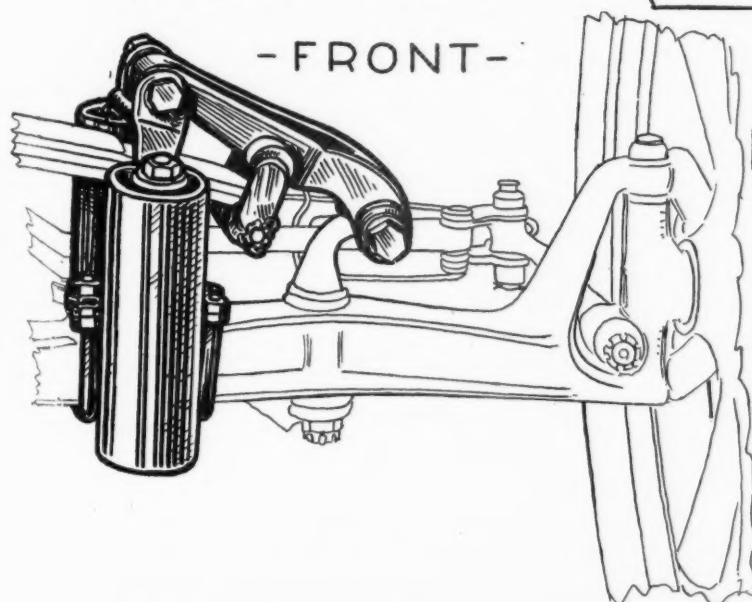
THE CONNEAUT PACKING COMPANY, Conneaut, Ohio

"Conneaut"

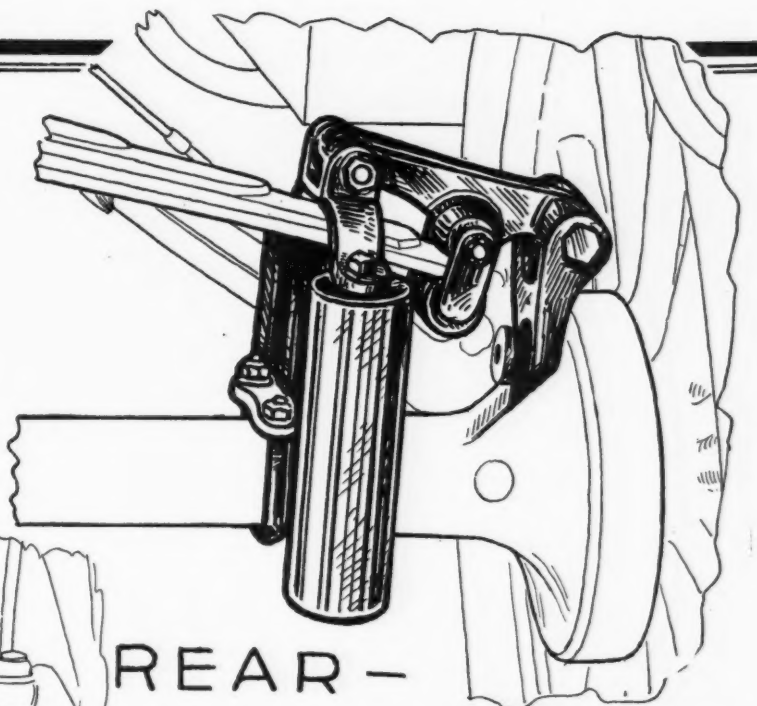
PLASTIC METALLIC
PUMP PACKING

Something NEW
Something Different
Something Better

VESELY SHOCK ABSORBERS for FORD Cars



- FRONT -



REAR -

This absorber has been pronounced by engineers a very notable step toward perfection in shock absorber design. Your customer may try these absorbers for fifteen days and if not entirely satisfied money will be cheerfully refunded. The Vesely Shock Absorber is very simple in operation yet 100 per cent efficient over all manner of road conditions. It is a mechanical impossibility for ordinary automobile springs to protect the car from all the bumps on the road. It is only through some scientific and automatic method that perfect ease in riding is made possible. The Vesely Shock Absorber supplies that method.

Vesely Shock Absorbers will pay for themselves in a very short time through the comfort they give and the years they add to the life of the car and the miles they add to each gallon of gasoline.

Absolutely No Side Sway
A Combination Snubber & Absorber
Quickly Installed

The Car Maintains Its Level

Manufactured by

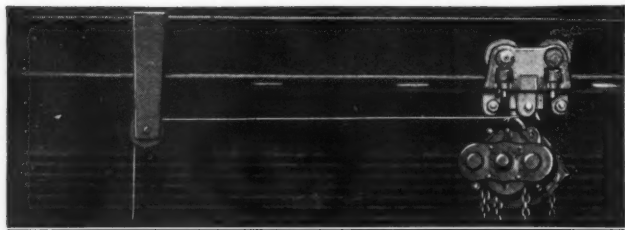
Vesely Shock Absorber Co. Cedar Rapids, Ia.

J. L. Lehman & Co. Sales Representatives
Cedar Rapids, Iowa

CHOICE TERRITORY STILL AVAILABLE TO RESPONSIBLE
DEALERS AND DISTRIBUTORS

Write or Wire for Further Particulars

Patents Granted July 12, 1921—Nov. 13, 1923—Nov. 13, 1923—
Dec. 11, 1923—Others Pending.



MATCHLESS TROLLEY

"Easiest to Start-Easiest to Keep Going"



Pulling a 1-ton Load with a 14-lb. Weight

The above test is graphic proof of the little effort required to start a heavy load and convey it to any desired point, when carried on a Matchless Timken-Roller-Bearing Trolley.

At 14 lbs. the trolley with its 1-ton load, started smoothly and rolled rapidly along the length of the overhead rail.

The Matchless required only about half the pull demanded by any other trolley—ball or roller bearing—when given the same identical test.

Matchless Trolleys in your plant mean less energy used, speedier action and more output per man.

Chisholm - Moore Matchless "Trolleys," "Cyclone" Chain Hoists, and "Carryall" Overhead Track Systems carried in stock by capable distributors in all localities.

Complete catalog, price and name of nearest representative on request.

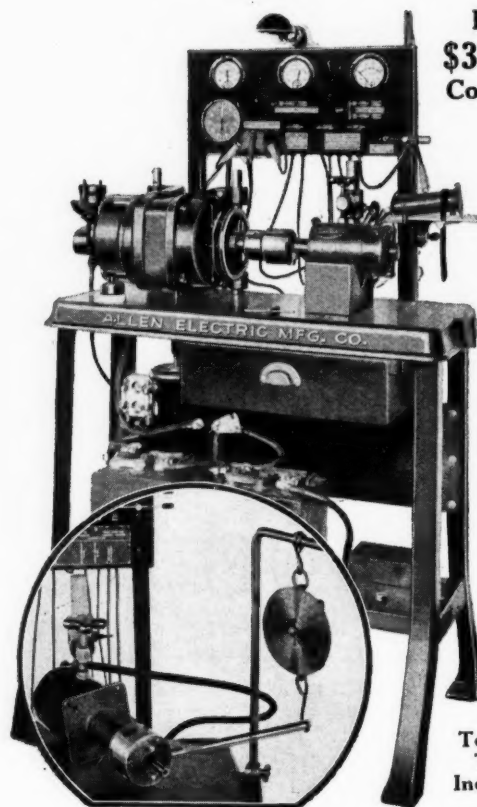
The Chisholm-Moore Mfg. Co.
Cleveland, O.

Hoists Cranes Trolleys
Overhead Track Systems

Branches: New York, Chicago, Pittsburgh



Price
\$375.00
Complete



Torque
Test
Included

UNIVERSAL TEST STAND REALLY COMPLETE

Powered by a motor that has absolute stability under stress of the heaviest load and ample speed range—0 to 3500 R. P. M.—Allen Universal Test Stand possesses the essentials that make it a really complete testing unit.

Absolutely complete for accurately testing generators, starting motors, ignition systems, magnetos, cutouts, ammeters, etc. Allen Universal Test Stand has been pronounced one of the finest pieces of electrical equipment yet developed for automotive service.

There are many new features—extreme simplicity of operation makes this unit profitable from the very start.

*Write for our new
catalogue—just out.*

Allen Electric Mfg. Co.

2204 West Fort Street

Detroit, Mich.



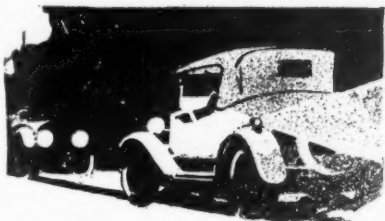
Does not
command
to stop—
but gives
a Friendly
Warning—
a courtesy
to the
approaching
driver.



The Warning Hand

A new VICTOR lamp. It is a PARKING— TRAFFIC — COURTESY — WARNING LAMP, combined in one, and is known as the VICTOR No. 25 "SENTINEL."

The lamp is made of zinc (cannot rust), has a nicked finish, and is drum shaped, being $3\frac{1}{2}$ in. in diameter. It has a double filament bulb, a white frosted lens in the front and a red ruby lens in the back. The lenses are of pebbled glass, and have the outline of a human hand molded into them.



The "Sentinel" provides double safety. In addition to flashing a red warning hand to the rear, it lights the driver's hand as he signals his intended action, and also courteously illuminates the side of the car for vehicles passing in either direction.

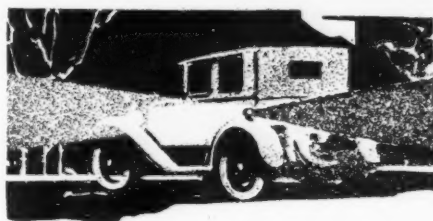
The major filament is operated by the VICTOR No. 2 "Dependable" stop lamp switch (which is supplied with the lamp), and furnishes the courtesy and warning lamp features.

The No. 4, a VICTOR designed instrument board switch, of the latest type, is furnished for the minor filament and parking lamp feature.

Built to VICTOR standards of quality and workmanship. Priced to every car owner's advantage and discounted to you for profit.

THE CINCINNATI VICTOR CO.
714 Reading Road Cincinnati, Ohio

Victor
TRADE MARK



The "Sentinel" is a most efficient parking lamp. The minor filament, of less than one c.p., is very economical, and at the same time gives a good parking light. Furthermore, many states have strict tail light laws, and in an emergency, it can also be used for this purpose.



Reduced Prices on COLONIAL CYLINDER HONES *With Dial Gauge*

Because of increased production made necessary by greater sales volume we have been able to cut our list prices in half. You can now get genuine Colonial Cylinder Hones for \$17.50 each. They are made in three sizes—No. 1 for bores from $2\frac{3}{4}$ " to $3\frac{1}{8}$ ", No. 2 from $3\frac{1}{4}$ " to $3\frac{5}{8}$ ", No. 3 from $3\frac{3}{4}$ " to $4\frac{1}{2}$ ".

Concave cutting stones are an exclusive patented feature of the new Colonial Hones. This prevents the possibility of the stone losing its cutting edge by filling up. It is one of the biggest steps forward ever made in cylinder hone design. All Colonial Hones are self-centering, absolutely automatic and need no adjusting. They are used with a standard half inch electric drill. Can also be used in drill press when cylinder block is removed. They produce a "glassy" finish, making "wearing in" unnecessary. Any mechanic can do expert work.

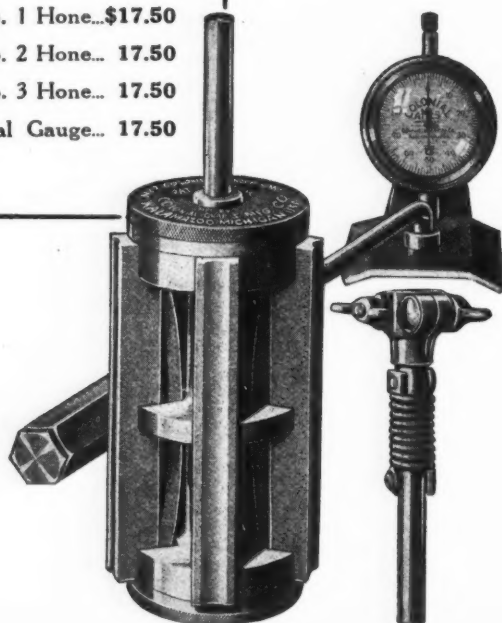
The Colonial Ames Dial Cylinder Gauge—price \$17.50—proves straightness, roundness, size and scored cylinders. Can be read by anybody—accurate result is shown on the dial.

At the new reduced prices you cannot afford to be without these excellent tools. Order direct from us, mentioning your jobber's name, or write for complete details.

New Prices

No. 1 Hone...\$17.50
No. 2 Hone... 17.50
No. 3 Hone... 17.50
Dial Gauge... 17.50

Colonial Gear & Mfg. Co.
Kalamazoo,
Mich.



List Price
of all
Gaskets
on
Board

\$17.00

[Display
Board
Included]



A Silent Salesman A Constant Reminder A Reliable Money Maker

Holds 350 "Naco" Cork Gaskets including all numbers specified for use on Ford motor.

"Naco" Cork Gaskets are cut from "Naco" cork sheets manufactured from clean resilient Spanish cork with non-hardening binder rendering same oil, water and gasoline resisting.

The "Naco" Cork Gasket display for Fords is not only the *lowest priced* board on the market but the most *attractive*, the most compact and the only board with easel for counter display and chain for hanging on wall. Also contains outlines of gaskets with catalog numbers clearly shown for purchases and replacements.

If your Jobber cannot supply you, fill out the coupon and we will see that you get a board—and get it promptly.

NATIONAL
CORK
PRODUCTS, INC.,
359 OGDEN ST.,
NEWARK, N. J.

We are interested in the "Naco" cork gasket display for Fords. Kindly send us dealers' circular with full details.

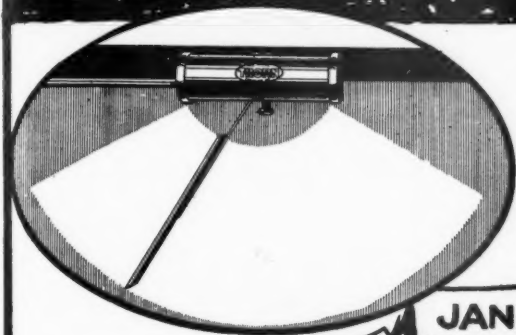
Name

Address

City and State

My Jobber's name is

Built to increase Sales!



Now is the time!



The price of \$5.00 gets 'em

Mechanical Details

A small vacuum pump operates from the vacuum tank or intake pipe, powerful enough at all times to keep a generous arc of the windshield clear and unobstructed during the hardest snow, sleet or rain storm. The speed of the pump is easily adjusted at the driver's desire by a small regulating thumb screw. Easily and quickly installed on any type of car.

When you show the Thorn Automatic Windshield Wiper and the car owner sees how well it's made and how beautifully it works, and how easily it can be installed—he's sold. Accepting his five dollars is a mere detail.

The automatic feature appeals to them—for every car owner knows that in rough weather, when driving is most difficult, the added job of wiping the windshield, by hand, is sad news. And here's an automatic wiper that costs little more than a hand wiper. That's a clincher.

The Thorn is neat in appearance, positive in action, light in weight with all metal parts non-corrosive, and it's fully guaranteed. It will last as long as the car.

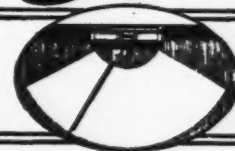
Your dealer can fill your order, or send to us for direct shipment, giving name of dealer.

THORN MACHINE TOOL CORPORATION
306 Industrial Bldg. Syracuse, N. Y.

✓
*Ask jobber
about
this
Adv.*

\$5.00
LIST

Works so well and costs so little



For "CHEVROLETS"



\$1.25

A "TASCO" Visible Gas Gauge

Replaces cap in gas tank. Just screw in in place of gas cap—and the job is done.

Quick, efficient, durable, lasting, unfailling in operation. A sure-fire rapid seller.

For FORDS A "TASCO"

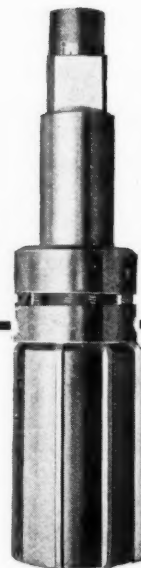
Visible Gauge
at the same price,
\$1.25

Takes place of regular gas cap underneath seat cushion. Just lift cushion—and you get the reading.

Two big sellers. Both real utilities—both reliable.

At your jobbers or write direct. Distributors get our proposition.

The Akron Selle Co.
AKRON OHIO



Exhibits at both New York and Chicago Automobile Shows.

Arrange for special demonstrations under actual service conditions.

EVERYONE interested in the vital problem of prolonging the useful life of a motor should learn every detail of a re-conditioning plan which has met with phenomenal success in those territories where it has been tried out during the past year.

With a very low initial investment, service stations can secure a franchise to become F-J Reconditioning Stations. Re-finishing cylinders and fitting over-size pistons is now possible without costly equipment primarily because of the wonderful work done with an F-J Cylinder Reamer, the only micrometer adjustment reamer in the world. Most engine blocs may be reamed without removing from the chassis—in an amazingly short time—at an attractive flat rate—and all the profit kept in the shop.

Jobber co-operation to the fullest extent. Strong advertising helps are offered all along the line.

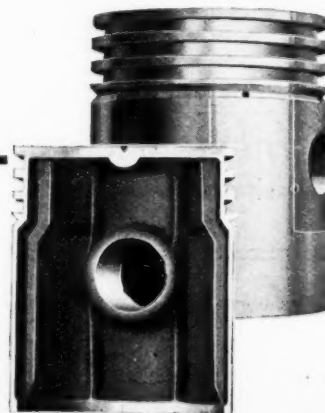
F-J CYLINDER REAMERS

FOSTER Light Weight Pistons

The Profit Bringing Combination

Franchises will be allotted in the order of applications received, therefore write us at once.

FOSTER-JOHNSON REAMER CO.
1144 Beardsley Ave. ELKHART, INDIANA



Profit on Mid-Winter Repair Work By Using Huetter Fly-Wheel Gear Bands



Huetter Gear Bands are shipped in a hurry through your jobber. Order direct, or write for our complete catalog price list.

You can make a two-way profit on your mid-winter repair work if you use Huetter's Fly-Wheel Gear Bands. Profit on each job and gain a satisfied customer in each Huetter Gear installation. Huetter's Gears are a guarantee of endurance and positive meshing. They are made of hard, tough steel, electric welded at the seam and cut to Bendix Drive specifications.

Profit by reducing your investment without decreasing the efficiency of your stock. You can do this easily since Huetter's Gears, due to the *interchangeable pointing*, can be used on different cars regardless of which side the starter pinion enters from.

Huetter's

Fly-Wheel Gear Bands

HUETTER MACHINE & TOOL CO.

546 Kentucky Avenue, INDIANAPOLIS

WRIGHT

HIGH SPEED HOISTING & CONVEYING OUTFIT

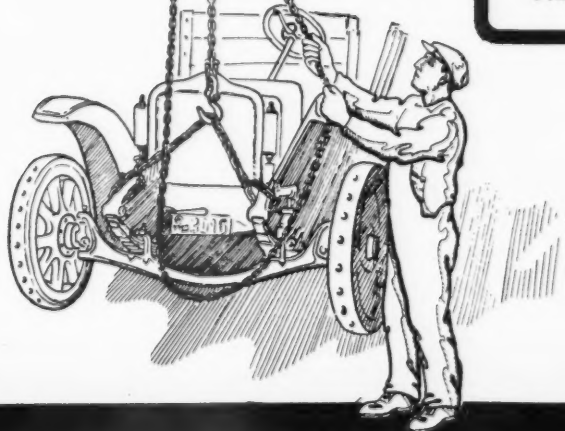
ONE TON OUTFIT
15 Ft. 6" I Beam

1 Ton Plain Trolley

1 Ton High Speed Hoist

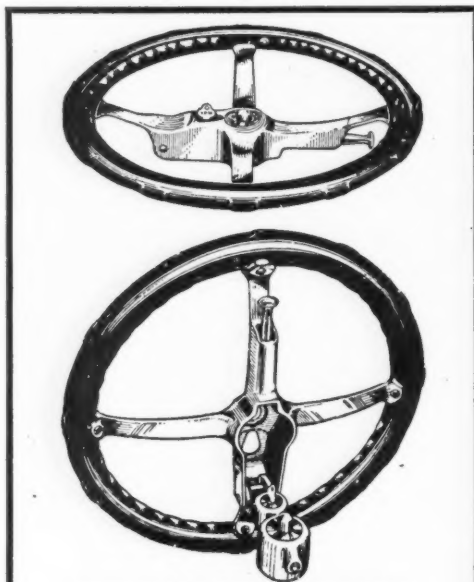
NECESSARY HANGERS
PRICE COMPLETE \$100.00

1/2 TON OUTFIT
15 Ft. 6" I Beam
1/2 Ton Plain Trolley
1/2 Ton High Speed Hoist
NECESSARY HANGERS
PRICE COMPLETE \$80.00



WRIGHT
MANUFACTURING
COMPANY
LISSON, OHIO

This Big Spencer Wheel **TILTS** and **LOCKS**



CHEVROLET 490 and SUPERIOR
Also made for:
Ford, Dodge, Overland, Maxwell,
Star and Gray Cars
Oldsmobile 30



*—combining the features most
needed in small car wheels*

The Spencer wheel for small cars has everything this class of owners have called for—greater size, a knurled grip, convenient horn button, the tilting device and a theft-proof lock.

Approved by the Underwriters' Laboratories—they lower the owner's insurance rate. That in itself, without the comfort and freedom from worry they give—is a forceful selling argument.

And they move fast. Priced right with a discount that will interest you.

Most legitimate automotive jobbers carry the Spencer wheel in stock. If yours cannot supply you with the Spencer structural details and discounts, write us direct. We will furnish them promptly to both you and your jobber.

The Spencer Mfg. Co.

Spencer

Ohio

The handy package of Cable Packed the "Goodrich" way

100 feet of cable packed in a neat, dust-proof box, properly marked as to size and type—ready for the customer. This method of merchandising Goodrich Starting, Lighting and Ignition cable encourages the car owner to buy a supply rather than a short length.

Further—this new Goodrich Package enables the dealer to carry a complete stock of assorted types and sizes. No bulky, dusty, cumbersome reels—but a modern method that moves the stock.

We make a complete line of wires and cables for all classes of motor driven vehicles. A type and size to meet every need.

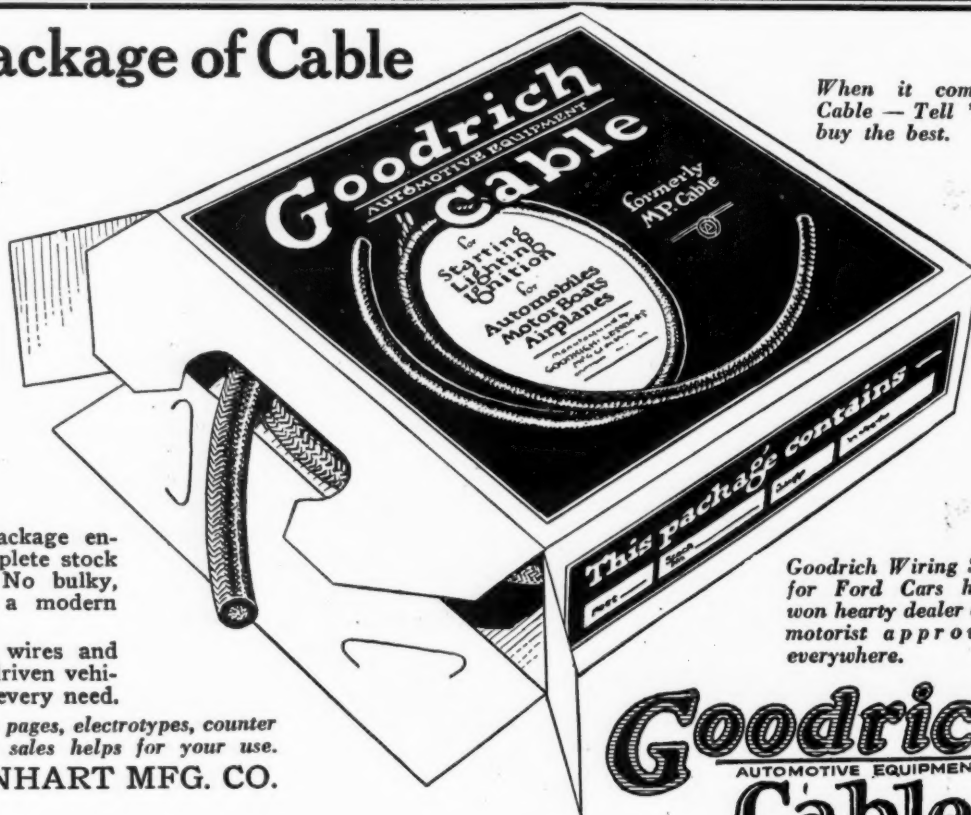
JOBBER: We have catalog insert pages, electrotypes, counter literature, sample kits and other sales helps for your use.

THE GOODRICH-LENHART MFG. CO.

HAMBURG



PENNSYLVANIA



*When it comes to
Cable — Tell 'em to
buy the best.*

*Goodrich Wiring Sets
for Ford Cars have
won hearty dealer and
motorist approval
everywhere.*

Goodrich
AUTOMOTIVE EQUIPMENT
Cable
Starting—Lighting—Ignition
Formerly M D



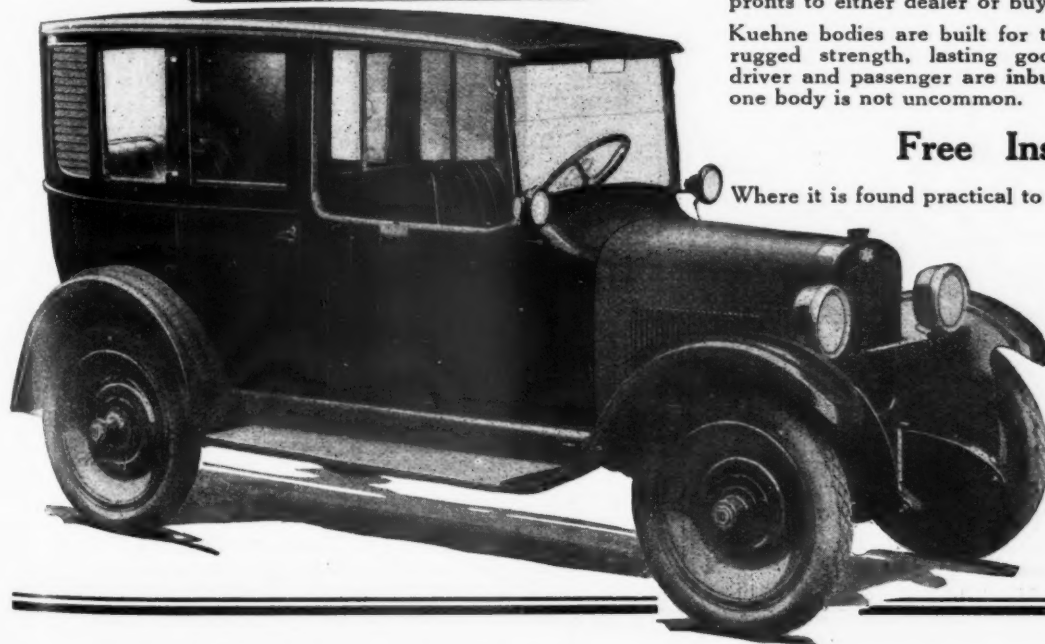
**Only a
Holmes Auto Wrecker
Could Have Done This**

To lift the wreck, and swing it sidewise, any but a Holmes wrecker would have had to drive across the road with the wreck swinging from the derrick. While one man drove, another would have been needed to steady the wreck. Traffic blocked meantime.

One man with a Holmes Wrecker lifts, swings, and hitches the wreck while traffic goes along undisturbed.

ERNEST HOLMES COMPANY, Chattanooga, Tenn.

**Ask Your
Jobber
About
No. 485**



Round Out Your Line

The average city has a brisk demand for taxicabs—which the average dealer should supply. The business is rightfully his.

Properly designed and built taxicab bodies however, are needed, for the second-hand limousine does not pay full profits to either dealer or buyer.

Kuehne bodies are built for taxi service alone. Long life, rugged strength, lasting good looks, great comfort for driver and passenger are inbuilt. Selling three chassis for one body is not uncommon.

Free Installation

Where it is found practical to deliver the chassis to our factory we install the body complete, ready to run without charge. Act promptly as this is the season to make taxicab sales.

L. F. KUEHNE CO.

2609 Archer Ave.
Chicago

"Coach Makers Since 1888"

Announcing A New Price



\$6⁰⁰

COMPLETE
WITH LOCK
AND
LICENSE
PLATE
HOLDER

Duplex SECOND SPARE TIRE CARRIER & RIM TOOL

Every Duplex is now furnished complete with lock and license plate holder. The old price was \$5, the new price is \$6.

One type carries all size tires. Dealers need stock but one size. Attached instantly — no tools needed. Tires cannot rub and chafe. No interference with use of tire covers. Strong and rigid — three point suspension. Can be transferred from one car to another. No bolts, straps, nuts or additional parts.

Display cards, circulars and other sales helps are furnished to dealers. Co-operation is given to jobbers.

Write or wire for full details.

TRIPP-SECORD & CO.

606 KERR BLDG. DETROIT, MICH.



Bosch



Waterproof—
Everlastingly
Dependable

Type ZU4 Magneto

Join the Blue Ribbon List of
Robert Bosch
Distributors
and
Service Stations in 1924.

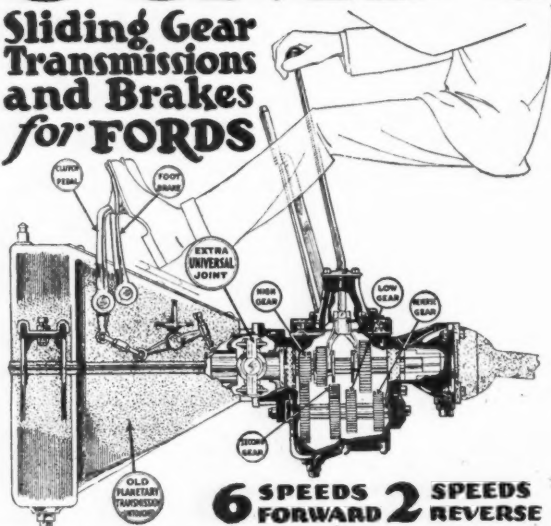
Ask us for the details of this
Selling Franchise.

Robert Bosch Magneto Co., Inc.
Otto Heins, President

123 West 64th Street New York
Chicago Branch: 1302 South Wabash Ave.
Service Stations in Principal Cities the World Over.
The Genuine, Original Bosch means Robert Bosch only.

JUMBO

Sliding Gear
Transmissions
and Brakes
for FORDS



6 SPEEDS 2 SPEEDS
FORWARD REVERSE

JUMBO TRANSMISSIONS double the Ford's efficiency without changing the design. Provide standard S. A. E. sliding gear transmission with 3 speeds forward and one reverse. Also equipped with Power Reduction Drive for truck use which gives 6 speeds forward and 2 reverse. Only transmission with extra universal joint. Both speed and power.

JOBBER: Write for sales plan.

DEALER: Write for name of nearest distributor and get full information on JUMBO.

PRICE-HOLLISTER CORPORATION

Dept. 200 Rockford, Ill.

30 Per Cent Stronger and Tougher

The New Victor Cap Screw so far surpasses all previous production that the manufacturers are enabled to guarantee—at no greater cost—cap screws which are at least thirty per cent stronger and tougher in every way.

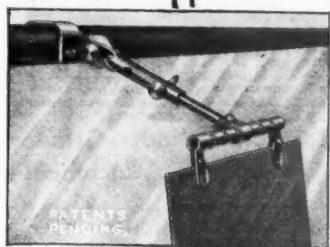
The development of a much better type steel which contains a higher carbon content makes possible this innovation in cap screw manufactory.

Write for our stock list.

VICTOR-PENINSULAR CO.
DETROIT, MICH.

K-W Glare Shield

Makes Night Driving Safe As By Day



See It
at the N. Y. Show
Space G-20

The driver does not have to change position, or strain to get his eyes in line with this shield. It is adjustable for all sizes of men and all styles of windshield.

That is a great selling point to drivers who have passed up other shields that make them crane their necks. Put it over strongly, and you will make many good profits.

Its blue-green color diffuses and softens the rays of approaching lamps or low sun. Its arm fits closed or open cars. Its profits make for a healthy credit balance every month.

If your jobber does not handle K-W Glare Shield, write us—but write in either case.

K. W. Glare Shield Co.

of Massachusetts

46 Cornhill

Boston, Mass.

Helps you pick the right puller

Greatest aid to picking out a Wheel or Gear Puller ever devised. On one stand, at one time, you see them ALL—and can pick the RIGHT one for your particular work. Two-arm and crowfoot pullers, four sizes of each. Look for the Crane Puller rack at your jobber's. It will PAY you.

JOBBER'S: Greatest aid to wheel-puller sales ever. It is doubling and tripling sales in some places. Don't fail to get one—FREE.



Crane Puller Co.
Arlington, Mass.



→ Pumps 12 Gallons
Water per minute →



"CIRCULEX"
Positive Water
Circulation

A new and distinctive pump for Ford Cars. The only pump that seals the water from the bearing, thereby allowing perfect lubrication by Wick Oiler.

**EVERY PART
RENEWABLE**
Order from your
jobber—
Price complete
with belt
\$3.90

1. "IMPELLER" scientifically constructed and Rustproof.
2. The only pump that has a seal to prevent water from entering bearing.
3. No water is sealed in the bearing thereby allowing perfect lubrication.
4. Special alloy bearing.
5. Flat belt pulley.
6. "Wick Oiler and Well" feeds oil automatically as pump needs it.
7. The pump installed—requires only 20 minutes to install.

PRICE BROS., INC.

FREDERICK

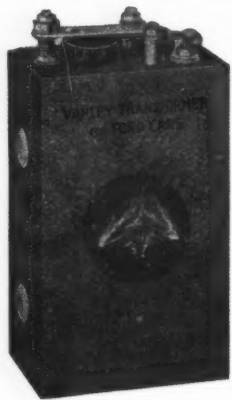
MARYLAND

WESTERN REPRESENTATIVE
Roland S. Boreham
600 Metropolitan Bldg., Los Angeles, Cal.
CENTRAL REPRESENTATIVE
Hal Taylor Company
1523 Republic Bldg., Chicago, Ill.



← At a Speed of 18 M.P.H. ←





High Tension Ignition for FORD CARS

\$2.50 each

The heat, increased about 300 per cent, is so very intense and the sparks are of such long duration, that the fuel combustion is nearly complete and the plug points are thereby kept free from carbon and lubricating oil.

The Varley Transformer has the same dimensions as the regular Ford coil and the change from the old to the new ignition requires but a minute. No wiring alterations are required.

Write for full particulars.

The Autocoil Company

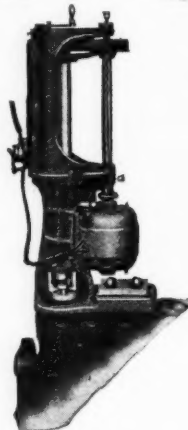
15 Exchange Place, Jersey City, N. J.

The Varley Transformer gives the same number of magneto sparks as do the regular Ford coils, but they are of the true high tension magneto type.

Best Paying Tool In Automobile Service Work

N. L. James, Tillsonburg, Ontario, says: "It nets me \$25 a day." Doggett & Sappington, Independence, Kans., say "It would take a lot to get us to trade even for some of the \$3,000 ones." Dashiell Motor Co., Chicago, says: "The grinding is superior to any finish we have seen." Hundreds of users—Garages, Service Stations, Owners of Truck Fleets, Bus Lines, praise it highly.

New Model "B" with 1/2 H. P. Motor and many other improvements.



Simplicity

Portable Cylinder Grinder With Boring Attachment

Brings you the bulk of the best overhauling jobs. One out of every five motors were reground or rebored last year. Simplicity bores and grinds all cylinders 2 3/4 to 5 1/16 inches in diameter. Motor operates under all field conditions. Any mechanic can operate it.

COMPLETE OUTFIT includes signs for indoor and outdoor use, circulars for your customers, movie slide and ads for your local paper. Business starts at once. Extra profits of \$850 to \$4,000 a year being made with Simplicity.

Pat. Mar. 16, 1915; Free Trial, Easy Terms, Rigid Guarantee
May 11th, 1920.
Other patents pending.

Write at once for full particulars

See Us At The Auto Shows—New York—Chicago

SIMPLICITY ENGINE & MFG. CO.

Dept. C, Port Washington, Wis.

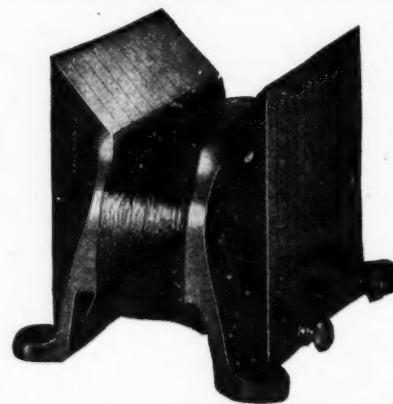
District Men Wanted for open territory. Attractive proposition for those who can qualify. Write for full particulars.

STA-SET

THE wise motorist and the practical mechanic buys tools with the greatest scope of usefulness—and the up-and-coming dealer stocks them. STA-SET Adjustable Wrenches, with the patented automatic rigid jaw-locking feature (Grips, Man how she Grips!) reduce your wrench investment while increasing your profits through rapid turnover. Four sizes; two finishes.

Write for illustrated folder and price list, giving jobber's name.

HJORTH TOOL CORPORATION
JAMESTOWN, N. Y.



This Growler Costs But \$4.50

With it you can tell in ten seconds whether an armature is in good condition. If it is not, you are saved all the grief of having to do the whole job over, losing all your profit and the customers' goodwill besides. Operates on 110 Volt A. C. Current.

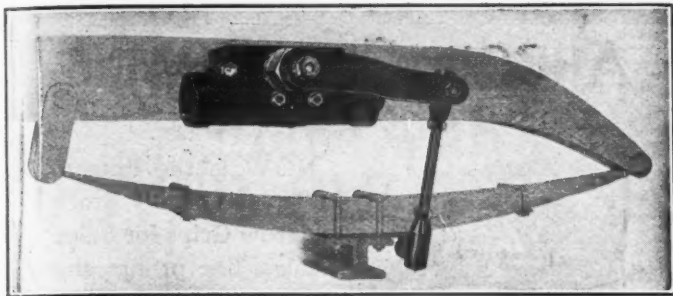
Sold direct or through your jobber. Resale price \$4.50 in Central and Eastern States, \$5.00 in Pacific States. Your check for above amounts plus twenty-five cents postage brings this moneymaker to you.

ARMATURES: We rewind any and all kinds of GENERATOR, MOTOR and MAGNETO armatures, and reship same day old armatures received.

FORD GENERATOR AND MOTOR ARMATURES.....	\$ 1.50
ALL SMALL DOUBLE UNIT GENERATOR AND MOTOR ARMATURES.....	5.00
SINGLE UNIT MOTOR GENERATOR ARMATURES.....	10.00
MAGNETO ARMATURES.....	\$3.75 to \$4.75

Armature Rewinding Co., Inc.

3301 Washington Blvd., St. Louis, Mo.



Controls the Springs—

A double-headed piston, within a cylinder, working both ways against a body of oil. A smooth even pressure that absorbs all shocks.

The hydraulic principle of absorbing shocks doesn't prevent the natural action of the springs—it controls the action.

A 10-pound jolt is met by an opposing force of 10 pounds. A 200-pound jolt is met by an opposing force of 200 pounds. This principle permits smooth, velvety spring action—natural but controlled.

2-Way Hydraulic Shock Absorbers are easy to install—have an unusual service record—are an extremely fine proposition for live dealers.

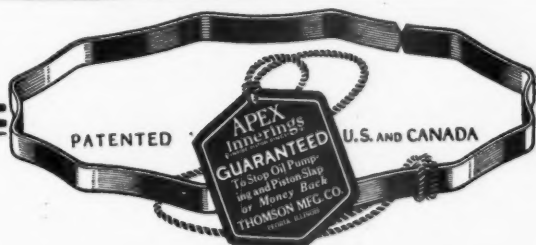
Write for full details.

Auto Spring Control Co.

Jamestown,

New York

2WAY
HYDRAULIC
SHOCK
ABSORBERS



GOOD BUSINESS Follows

Wherever Genuine Apex Innerings are installed in motors to stop oil pumping and piston slap good business results—for not only do they do the work and make satisfied customers who "come back" for other automotive necessities and labor jobs but they spread the word that you stock

GENUINE

APEX INNERINGS

(INSIDE PISTON RINGS)

in all standard and "over-sizes"—the one successful, fully guaranteed device that needs no expensive mechanic's time cutting and fitting but comes ready sized and shaped for quick installation.

RETAIL
PRICE
20c

each up to 3/4" wide
or 5" diam. Larger
35c. Insist on our
Guarantee Tag.

STOP PISTON SLAP
and oil pumping, vibration, excessive carbon and renew power, silence and economy. Now is a wonderful time to build up a dandy installation business in repowering cars for Spring.

Dealers and Jobbers

will do well to investigate today—find out about the sales and satisfaction others are getting.

THOMSON MFG. CO.

Pearla

Dept. C,

Illinois

Pliers for the Home as Well as the Car



DEALERS can now sell two MoToR KiT Pliers where they sold one before, by mentioning to the purchaser that MoToR KiT Pliers are just as necessary to the home as they are to the garage. They can be used in so many ways. Radio, children's toys, making adjustments on household appliances and hundreds of other uses can be mentioned. MoToR KiT is the ideal plier for the home because of its sturdy construction and reliability.

CRESCENT TOOL CO.
JAMESTOWN, N. Y.

Originators of the
CRESCENT WRENCH

CRESCENT TOOLS

IN CLEVELAND—IT'S THE HOLLENDEN

Not Expensive

ROOMS—

Large comfortable and well-furnished:

83 Rooms, hot and cold running water, \$2.50
210 Rooms, single with bath, \$3.00 - \$3.50
192 Rooms, with bath \$4.00
160 Rooms, double, with bath, \$5.00 - \$6.00
135 Rooms, large double with bath, \$6.00 - \$7.00
Many Sample Rooms and Parlor Suites, \$7.00 up

BREAKFASTS—Club Breakfasts with generous portions at 65c, 75c and \$1.00.

LUNCHEONS—A la Carte in four nationally famous restaurants.

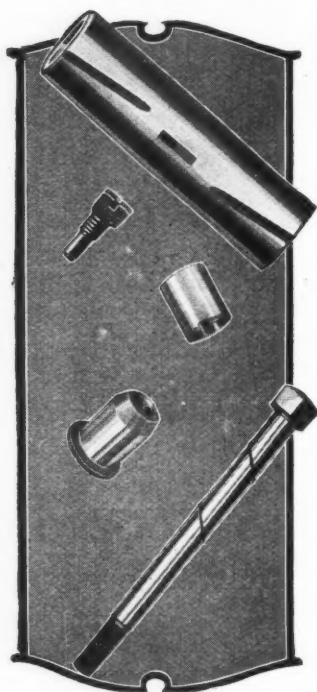
DINNERS—A la Carte. Special Sunday table d' hote dinner at \$2.00.

CAFETERIA—Hollenden Cooking and Service at Cafeteria prices.

DANCING—Dinner Dancing with Carl Rupp's Hollenden Dance Orchestra every evening excepting Sunday. No Cover Charge.

ROSCOE J. TOMPKINS
Manager

KING QUALITY
ALL THE NAME IMPLIES
AUTOMOTIVE PRODUCTS



IT pays to sell
parts that
stand up in serv-
ice.

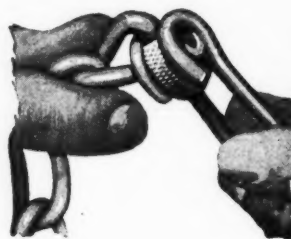
PISTON PINS

PISTON PIN
SET SCREWS

STEERING
KNUCKLE BOLTS
AND BUSHINGS

AUTOMOTIVE DIVISION
KING SEWING
MACHINE CO.
BUFFALO, N. Y.
BRIDGEBURG, ONT., CAN.

ARROW GRIP CHAINS
for Pneumatic Tires



NOW is the time to
display chains. Stock
Arrow Grips for quick
sales, fine profits and
customer satisfaction.

Quick Replacement
Fasteners make Ar-
row Grips the handi-
est tire chains on the
market. Replacements
made on the road
speedily and easily.

Their sturdiness satis-
fies men; their easy
attachment and re-
placement features ap-
peal to women.

See our Exhibit at the
Shows: New York,
Space 218, Main Floor;
Chicago, Space 76, Col-
iseum Gallery.

Ask Your Jobber or Write for Literature

ARROW GRIP MFG. CO., Inc.
106-126 Cooper St. Glens Falls, N. Y.
Export Office: 280 Broadway, N. Y.

"WHITNEY"
HIGH MILEAGE CHAINS

For Front End Drive Replacements

THOUSANDS OF SATISFIED USERS
THE BEST RECOMMENDATION

We Can Furnish Chains for the Following Cars:

Anderson	Franklin	Moore
Cadillac	Hall-Scott	National
Cane	Motor	Oakland
Chalmers	Haynes	Packard
Chandler	Hudson	Pan
Cleveland	Hupmobile	Rickenbacker
Columbia	Jeffery	Revere
Continental	Jordan	Saxon
Motors	King	Star
Davis	Lafayette	Stearns-Knight
Drexel	Lincoln	Studebaker
Essex	Lozier	Templar
Fageol	Mercer	Winton
Fox		

When you equip your motor with "WHITNEY" you can
forget your chain troubles.

THE WHITNEY MFG. CO.
HARTFORD, CONN.

New York
L. C. Biglow & Co.,
Inc.
243 West 55th Street

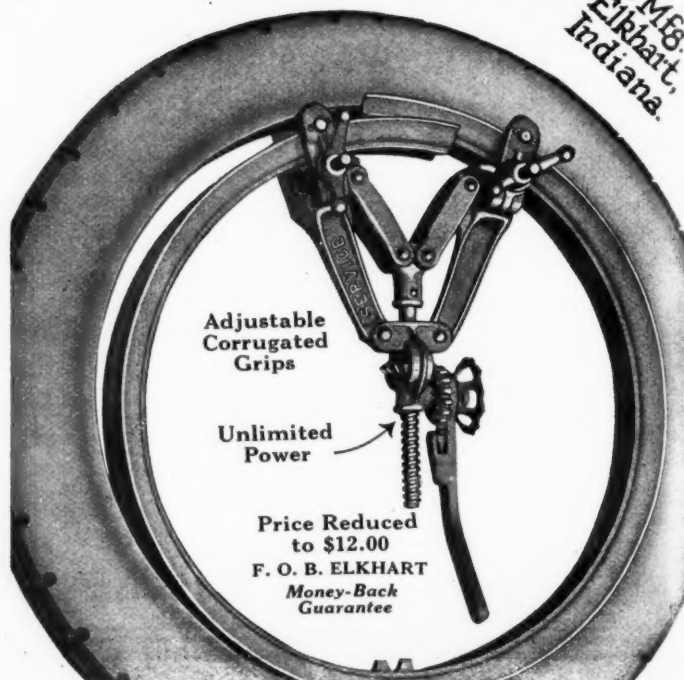
Boston
George C. Stell,
200 Devonshire St.

Philadelphia
R. J. Howison
624 Race St.

San Francisco, A. H. Coates Co., 770 Mission St.

**Service
Rim Tool**
5 minutes to any job

Write
Service Mfg.
Co., Elkhart,
Indiana.



Adjustable
Corrugated
Grips

Unlimited
Power

Price Reduced
to \$12.00
F. O. B. ELKHART
Money-Back
Guarantee

No More Broken Bulbs with DOVER BULB CASES

A new light is always handy and ready when the old lamp gives out.

Dover Bulb Cases have snug compartments for two large and three small lamps.

A safe, economical way to carry bulbs—they can't jar loose—they can't wobble around—they fit in snugly and securely. A safe, sane way to carry bulbs and prevent breakage.

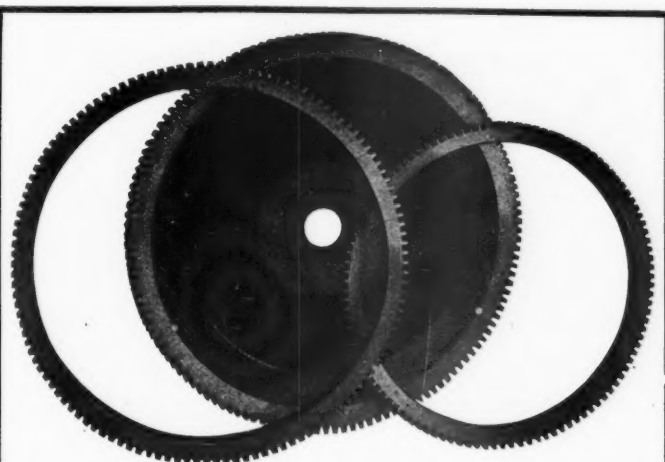


A complete case holding 2 large and 3 small bulbs only \$1.00 (without Bulbs)

Dealers and Jobbers: Dover Bulb Cases fill a real need—are priced right and sell fast. Display them and sell them. Make another profit. Write today.

DOVER STAMPING & MFG. CO.

385 Putnam Avenue
Cambridge 39, Mass., U. S. A.



New Low Prices On Fly Wheel Rings

Increased quantity production has enabled us to get out a new, and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

The Meachem Gear Corp'n.
Ring Dept. Syracuse, N. Y.



HYDROMETERS

Do Not Wear Out
They Break

"Break-Not"

Storage Battery Testers

**ALL THAT
THE NAME IMPLIES**

**The MOST WIDELY ADVERTISED
BATTERY TESTER in the WORLD**

Its many patented features guarantee a
Battery Tester of rare reliability.

Drop it on the floor—it will not break.

It is cushioned between the patented rubber
housing and the bulb.

The three-colored float can be easily read—
even at a distance.

SHOW THE "BREAK-NOT"

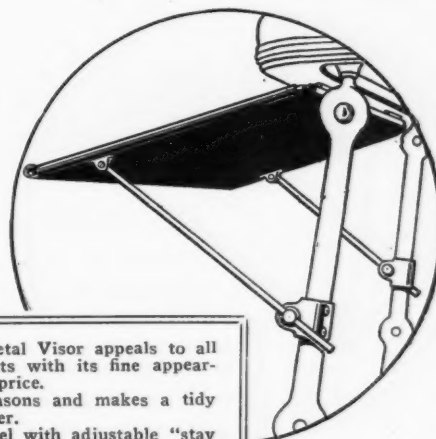
SELL THE "BREAK-NOT"

MAKE A BIGGER PROFIT

Price
\$1.00
and Worth it
EAST OF ROCKY MOUNTAINS

E. EDELMANN & CO.
Chicago. U.S.A.

**For
Sunshine
or Storm
in all
Seasons**



The Higgin all-metal Visor appeals to all classes of motorists with its fine appearance and popular price.

It sells in all seasons and makes a tidy profit for the dealer.

Made of sheet steel with adjustable "stay put" brackets. Finished in baked enamel—black outside—green inside. A gutter on the lower edge drains water over the side. Made for all cars including Fords.

Our selling plan gives you protected territory and real selling assistance. Write for it.

THE HIGGIN MFG. COMPANY
Automotive Division, Newport, Ky.

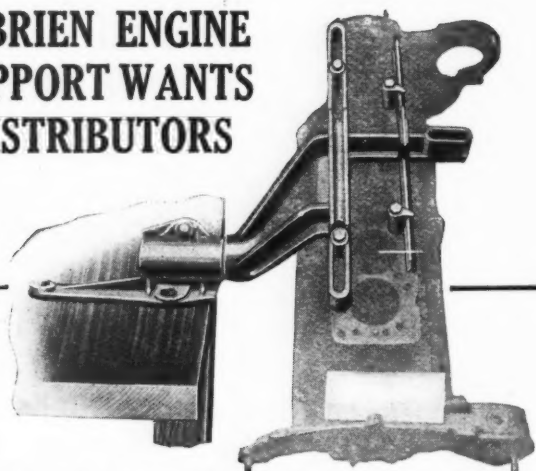
HIGGIN ALL-METAL VISOR

*Installed with a
screwdriver in
twenty minutes
on open or
closed cars.
Strongly made.
Cannot rattle,
flop, tear or
crack.*

**Sells for
\$3.50**

**and nets a
big profit.**

O'BRIEN ENGINE SUPPORT WANTS DISTRIBUTORS



Men Who Stand Well with Repairmen and Fleetowners

and who put real selling into their work. If you want to add several thousands a year to your income, write or wire now for our new, more profitable agreement. We have increased the distributors' share while raising no sales obstacles.

This support holds *all* demountable head auto and tractor engines and saves time on making repairs. Learn the score of excellent individual selling points from the illustrated literature waiting for you. Send for it now.

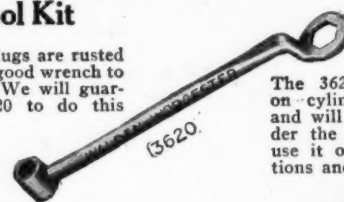
Some territory still open.

Banner Accessory Mfg. Co.

2629 La Salle St.
St. Louis, Mo.

Every Ford Owner Needs This Wrench In His Tool Kit

When spark plugs are rusted in, it takes a good wrench to remove them. We will guarantee our 3620 to do this trick.



The 3620 can be used on cylinder head bolts and will get the two under the dash. You can use it on water connections and other parts.

Show this number 3620 to every Ford owner, it will make sales, show you a good profit and be a fast seller.

WALDEN-WORCESTER
Incorporated
WORCESTER, MASSACHUSETTS



REBABBITTING

You can be sure of quality work, S A E, specification materials and the right price if you send your connecting rods to a WATKINS plant for rebuilding and refuse imitations of

WATKINS SERVICE

New Bolts and nuts, laminated shims, bronze wrist pin bushings, are part of the rod rebuilding at *no extra charge*. Bearing tinned in rod and broached to mirror finish and to standard size cuts time on replacements and holds down labor costs on flat-rate repair jobs. Send your burned-out rods today. All rods shipped same day they are received.



Send Rods to Nearest Factory for Quickest Service

Hartford, Conn., Ripley Motor Services
Indianapolis, Ind., Indiana Watkins Mfg. Co.
Kingston, Ont., Watkins Mfg. Co. of Canada, Ltd.
Los Angeles, Calif., Miller & McIntyre
Memphis, Tenn., J. B. Cook Auto Co.
New York, N. Y., Lake Sales Co.
Omaha, Nebr., Interstate Machinery & Supply Co.
St. Louis, Mo., H. & H. Mach. Co.
Syracuse, N. Y., Watkins Mfg. Co. of New York.
Toledo, Ohio, Stewart-Burman Co.
Washington, D. C., R-L Motive Parts, Inc.
Waterloo, Ia., All States Rebabbitting Service.
Wichita, Kans., Home Office—The Watkins Mfg. Co.



Keep All Your Overhaul Profits

You can avoid costly "come backs" and "make good" on repair jobs, protect your profits, and keep your customers satisfied by properly checking all parts.

The Eagle Universal Aligning Fixture

should be on your work bench—it is a guarantee of repair jobs well done. With it you will find it easy to detect the slightest bend or twist in connecting rods and pistons both before and after assembly. It is also an efficient tool for proving wrist pins and bushings and for detecting crooked boring of pin holes.

The patented bushings of the Eagle Aligning Fixture make it the most complete and only universal fixture on the market.



*The Eagle is sold through Jobbers.
Write us for complete information*

EAGLE MACHINE CO.

24 North Noble St., Indianapolis

KESS High Speed Valve Grinder

Positively Grinds valves in $\frac{1}{4}$ usual time and guarantees a better job. Can be operated at 4,000 r.p.m. Fits any electric drill or hand drill. Absolutely NO VIBRATION. Weighs 8 ounces. Easily reaches rear cylinder of Fords. Price \$5. Get details from us or from any electric drill manufacturer.

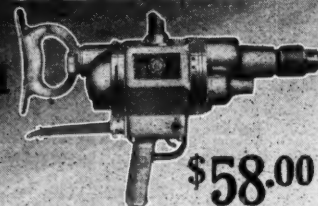
Kess Manufacturing Co.
809 Harrison Bldg.
Philadelphia, Pa.



BLACK & DECKER

SPECIAL
HALF-INCH
DRILL

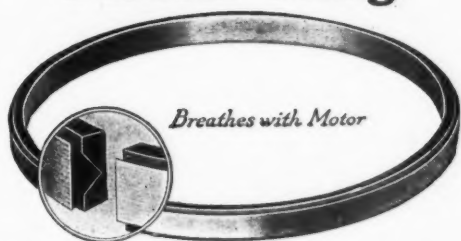
*"With the Pistol Grip
and Trigger Switch"*



\$58.00

THE BLACK & DECKER MFG. CO.
Towson, Md.

Hoess Human-ized Piston Ring



When there's work to do, the Hoess-Human-ized ring expands to do it. The rest of the time it contracts and relaxes, saving power and wear on the cylinder walls.

The outer section is pressed down by the compression on compression and power strokes. It wedges out against the cylinder wall, forming a perfect seal. Its lower edge scrapes oil downward. Two section construction makes it very flexible, so it adapts instantly to out-of-round cylinders.

Two Profits

First there's the money profit, which is very good, since our prices are right, and discounts wide. Second, there is the good-will profit from uniformly satisfied customers. Both are well worth having.

Ask your jobber now for Hoess piston rings for that job out in the shop. Get both those profits. If he has not yet got Hoess Human-ized rings, send us his name.

HOESS BROTHERS

State and Jessie Streets

Hammond, Ind.

**Most Complete Line
Manufactured in the
United States**

**Dependable
Reamers**

SPiral FLUTE

TwIST DRILL

TAP

SPECIAL TOOLS FOR EVERY MAKE OF CAR

Moore & Moore, Inc.

Reading, Pa.

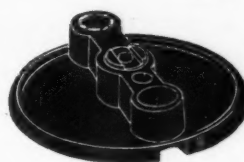


**ORDER
DISTRIBUTOR HEADS
(BAKELITE)**

and

ROTORS

COMPLETE
DIRECT FROM THE
MOLDER



GENERAL INSULATE CO.

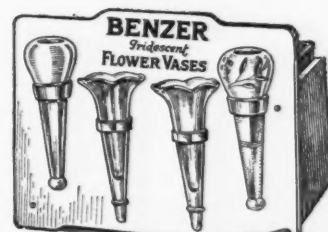
1033 Atlantic Ave., Brooklyn, N. Y.

Established 1905

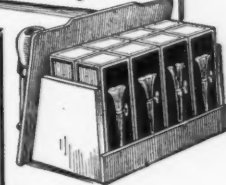
Let This "Silent Salesman"

Sell

**Benzer Vases
for YOU!**



\$2.00
Each
Retail



This handsome metal display cabinet (11" high by 15" long) is supplied free of charge with every order for 12 Benzer Iridescent Flower Vases. It will compel attention and make sales.

Every closed car owner is a live prospect for Benzer Iridescent Flower Vases. Colors permanently blended in; fitted with nicked bronze holder, **THAT WILL NOT RATTLE!** Packed in individual cartons. Liberal margin of profit for you.

Avoid loss of sales by having a complete stock on hand at all times. Have your jobber's salesman keep your cabinet filled.

THE BENZER CORPORATION

Manufacturers of Winddeflectors,
Headlight, Ruby and Spotlight Lenses, Vases, etc.

Myrtle & Cooper Aves., Brooklyn, N. Y.

BENZER
AUTOMOTIVE
GLASSWARE



Franklin

The
Super Single Stage
Air Compressor

Has no complicated devices, no fancy accessories, no unnecessary parts. Everything strong, durable, with a specially designed compressor having super-cooling spiral cylinder fins. The patented Unloader saves electricity and cuts down repair bills. Standard replacement parts. Order today from your jobber or write for full particulars. \$225 f. o. d. Norristown.

FRANKLIN AIR COMPRESSOR WORKS

2604 Main Street, Norristown, Penna.

"Extensor" Rubber Endless Flap

Protects the inner tube from contact with grit and rust on rim bed.

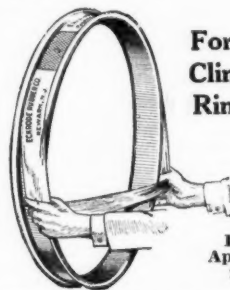
Prevents bead cuts. Makes it impossible for tire to freeze fast to rim.

Motorists can see it pays for itself out of what it saves in tubes and trouble.

The "Extensor" is made of rubber, with flannel reinforcement at valve hole. It lies flat and will not creep. Eliminates pinching.

Only two sizes to stock, 30 x 3 and 30 x 3½. 30 x 3½ is interchangeable with 31 x 4. Individually wrapped and labeled in attractive colors. Packed by dozens of either size in counter display box.

If your jobber cannot supply you, write direct to us. Large Profit Per Sale.

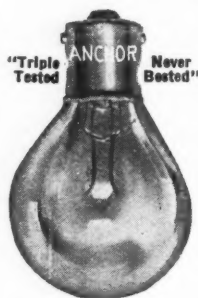


For
Clincher
Rims

Pat.
Applied
for

North Eastern Rubber Co., Elizabeth, N. J.

Speaking of Batting Averages Babe Ruth393 ANCHOR BULBS993



We are out to make it 1,000. Can't be done, you say? Our triple-test has kept one large auto lamp maker from finding a bad Anchor bulb in three years. Laugh that off!

JOBBER—What's wanted is a lamp that doesn't fail. What's wanted SELLS. The money-maker for you and your dealers is the Anchor: triple-tested, never bested.

SAME DAY SERVICE

Send a sample order, find out how quickly and accurately we ship; and with it get our prices and generous discounts. Obey that impulse! Write.

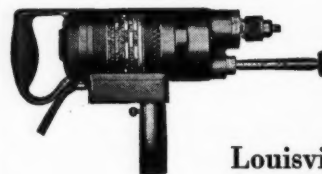
Anchor Electric Co.

555 W. Jackson Boul.

Chicago, Ill.

Get This "Pioneer" Garage Special

Electric Drill
and Valve Grinder



Greatest time and money saver, as well as money maker, for your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.

Incorporated

Louisville, Ky., U. S. A.

C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

Here Are the Reasons Why You Can Guarantee Our Plates

GENERAL plates are strong and porous; they deliver the current whenever called upon. No chipping out and softening for them,—regular users will tell you that. Write today for information about long-life GENERAL plates or any other battery parts you may need.

"Shop Talk
on Plates"

Let us send you this interesting little folder, just chockful of information.

General Storage Battery Co.

2005 LOCUST ST.

ST. LOUIS, MO.

SIMPLEX TRANSMISSION

for Ford Cars and Trucks

Three Speed
Sliding Gear
Type

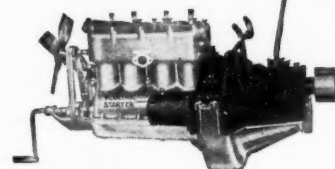
MORE POWER

26 to 1 in low.

In our new type

"CT"

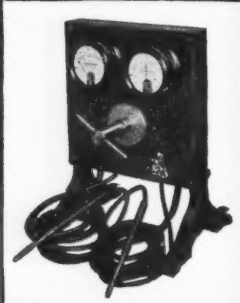
"It will pull like
everything."



This transmission has three speeds forward and one reverse and replaces the regular Ford transmission, drums, bands and all. The low gear is lower than the Ford, therefore more power, third is the same as the Ford and second is halfway between. It is ruggedly built with oversize alloy steel gears. Multiple disc clutch. Foot brake on jack shaft. Hyatt Roller Bearings. Installation easy, no cutting or machining.

E. D. & A. F. CRONK, Inc., 140 Hotel St., Utica, N. Y.

ACE HIGH-RATE BATTERY TESTER shows voltage drop and ampere draw



Inspires Confidence

Shows your customer in a positive way when his battery needs repairs or should be replaced with a new one. In addition to profit it adds to the appearance of your shop and inspires confidence in your ability.

Price \$39.50

F. O. B. CHICAGO

Voltmeter and ammeter, precision type, 4 inch diameter, sapphire jewelled. Variable carbon rheostat —0 to 600 amps.

ORDER FROM YOUR JOBBER

WEIDENHOFF

4350 ROOSEVELT ROAD
CHICAGO, ILL., U. S. A.

PARANITE CABLE

Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought PARANITE Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.

FOR 33 YEARS THE STANDARD

"IF IT'S PARANITE IT'S RIGHT"
Quality jobbers handle quality cable—that's PARANITE.



Indiana Rubber & Insulated Wire Co.
Factory and General Offices—Jonesboro, Ind.

JOHNSON No. 8 Adjustable Torch

Is inexpensive but a necessity for every shop. This Torch is fitted with one Powerful Johnson Gas Burner, which will quickly melt 20-25 lbs. of soft metal. The pot can be instantly removed and used for heating soldering coppers, long rods, or Burner can be removed and used as an efficient hand torch.

Write today for descriptive literature of Johnson Appliances.

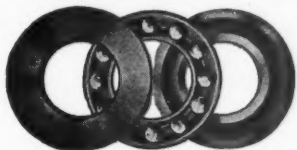
JOHNSON GAS APPLIANCE CO.
Cedar Rapids, IOWA

Pacific Coast Representative, C. B. Babcock Co., San Francisco, Calif.



No. 8
Adj. Torch

STAR BALL RETAINERS



For Thrust and Cup and Cone Bearings

THE BEARINGS COMPANY OF AMERICA
LANCASTER, PENNA.

Detroit Office,
1012 Ford Bldg.



VLCHek
SCREW-
DRIVERS

ROUND Shank Screwdrivers that can't turn in the handle. Forged lugs lock shank securely in wood without pinning. Ferrule crimped—can't loosen. Strong, easy-gripping tools of the right width, thickness and taper.

See our Catalog

THE VLCHek TOOL CO. Cleveland, Ohio

EASY TO SAY VLCHek

VLCHek TOOLS

MADE BY THE WORLD'S LARGEST PRODUCERS OF TOOL KITS



A complete substitute for dangerous acids, Zinc-Chloride, Sal-ammoniac and other mixtures commonly used as a Flux. Rubyfluid is quick acting, anti-rusting and is always ready for instant use. Ruby users include the foremost industries of the country.

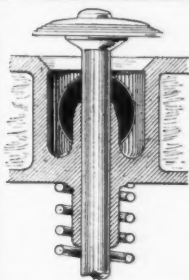
Send for generous Free Sample.

THE RUBY CHEMICAL CO.

68-70 McDowell St.

Columbus, O.

WHY NOT SHARE?



The big profits to be obtained from Boyle Never-Grind, Silent Valve replacements. Boyle Valves are guaranteed to produce all results claimed, thus assuring satisfied customers.

BOYLE Never Grind VALVE
Silent

Dealers, garage men, and repair men realize this. Write for our profitable distribution plan. Also obtain circular and price list regarding this remarkable valve.

BOYLE VALVE CO., 2101 LARRABEE ST., CHICAGO

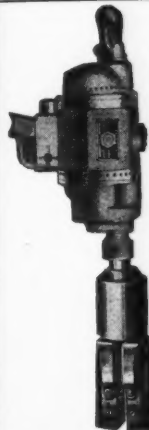
STORM HONE

Here is a tool which will renew cylinders not too badly worn, at a big profit and in a short time. Instant adjustment for all cylinders from 2 3/4" to 8". Simple and sturdy. The deep, heavy, wide faced stones on the Storm Hone mean longer life, faster cutting and smoother finishing. Complete and with extra equipment for fast cutting only \$40.25. The Storm Book, MODERN CYLINDER METHODS, will tell you all about it.

Send for your copy today.

STORM Mfg. Co.

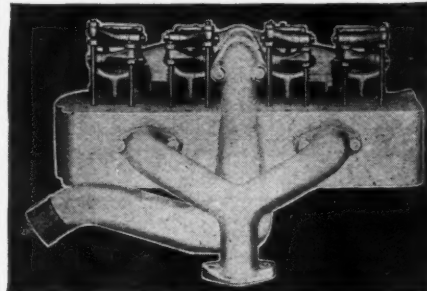
406 A Sixth Ave. So.
Minneapolis Minn.



E-197

ROOF 16 OVERHEAD VALVE EQUIPMENT For Ford and Dodge Motors ROOF 8 VALVE HEAD FOR FORD MOTOR

Stupendous Power—
Lightning Speed



Ford racing cars with Roof Equipment are rivals on mile and one half mile tracks of the highest priced racing cars. Doubles the pulling power of the Ford or Dodge pleasure car or truck. Hill climbing and general road work beyond wildest dreams of the owner. Complete — ready for installation — no machine work necessary. We are headquarters for all speed equipment. No matter what you want, write us. Racing quality — lowest prices. A postal card brings you complete list of our specialties.

Jobbers—Dealers—Consumers—Write Us
THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA

Racing FORDS

Write today for pamphlets and LOW PRICES covering Power-Plus Cylinder Head. Aluminite Racing Pistons and Connecting-Rods, High-Speed Camshafts. Rebuilding ALL MAKES of cars for racing a specialty. Nine years' experience.

GREEN ENGINEERING CO., Dayton, O.



8 Hour Constant Potential Battery Charging Pays Big!

Write us today on your business letterhead for information about HB 8-hour battery charging. HB Constant Potential pays big profits. Put your shop ahead of competition. New Patented HB Voltage Regulating Winding eliminates reversing, saves on current. \$20 monthly pays for your outfit. More than carried by big monthly profits. Hobart Bros. Co., Box AR 6, Troy, Ohio

Small Down Payment-Increased Profits Carry Balance



140 Combinations —all in this ONE set

Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Screws will not break. Fully guaranteed. Ask your dealer or write us.

The Eastern Machine Screw Corp.
10-20 Barclay Street, New Haven, Conn.

GENERAL ASBESTOS & RUBBER COMPANY



GARCO

ASBESTOS PRODUCTS

Branches
New York Chicago Pittsburgh
Main Office and Factories: Charleston, S. C.

"BULL DOG" Foot Accelerator for Fords



No stock of Ford Accessories complete without this popular item.

Manufactured by

The W. H. Thomas Mfg. Co., 404 W. Sixth St.,
Spencer, Iowa

Sales Rep. The Fulton Co., Milwaukee, Wisconsin

NEVER-LEAK

CYLINDER HEAD GASKETS

Heat-proof Gas-proof Can't blow out Retain their life
Oil-proof Water-proof Last longer Keep customers sold
One for every standard make of car, truck and tractor.

The Fitzgerald Mfg. Co., Torrington, Conn.



JACOBS CHUCKS INSURE ACCURATE DRILLING

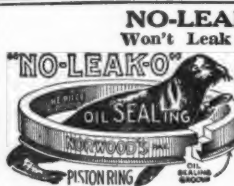
Write for circular, "A Jacobs Chuck for Every Purpose."

THE JACOBS MANUFACTURING CO.
Hartford, Conn.

QUICK GETAWAY FOR FORDS IN THE COLDEST WEATHER

The flattened design of the Krafve Intake Mixer Manifold spreads out and completely vaporizes the gas. Gives a quick start, easier pick-up, low throttle on direct drive, more speed and mileage. Easy to instal—excellent profit. List \$5.00. Write for proposition.

KRAFVE AUTOMOTIVE CORP., Oakham, Mass.



NO-LEAK-O PISTON RINGS

Won't Leak Because They're Sealed With Oil

No-Leak-O Piston Rings are making money for dealers everywhere. Their "oilSEALING" groove—found only in No-Leak-O—picks an oil film in between piston and cylinder walls like "packing" in a pump. Oil and gas stay where they belong. National advertising is helping the dealer sell No-Leak-O by teaching the motorist the lesson of more mileage on less oil and gas. It will pay you to stock No-Leak-O at once.

Price 35c and up.

NO-LEAK-O PISTON RING CO., Dept. T-57, Muskegon, Mich.



More
Power
Less
Fuel

Zenith - Detroit Corporation, Detroit, Mich.



BRAKE LININGS and CLUTCH FACINGS

Always used where safety and service are the first and only consideration.

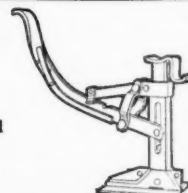
KELSO MFG CO.,

TRENTON, N. J.

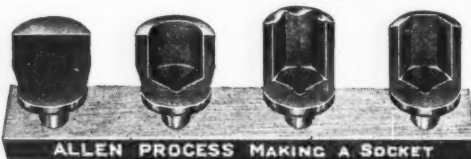
DISTRIBUTORS WANTED

For
"HENRY" One-Lift Jack for FORD and
Other Light Cars.
The Only One-Lift Jack on the Market.
The Only Jack Operated by the Foot.
Territory Available for Specialty Jobbers and
Distributors. Write or Wire.

WOLVERINE SPECIALTY CO., Inc.,
Battle Creek, Mich.



Cold-
Drawn
Sockets



ALLEN
Wrench
Sets

ALLEN PROCESS MAKING A SOCKET

The Allen Manufacturing Company, Hartford, Conn.



FOLBERTH Automatic WINDSHIELD CLEANER

"It Cleans
While
You Drive"

A good profit for you in this
wonderful, fast-selling necessity.
Ask your jobber or write.

THE FOLBERTH AUTO SPECIALTY CO., CLEVELAND

TAKE THE END-PLAY OUT!

—WITHOUT PULLING THE MOTOR



THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

Pat'd 7-22-'22

ADJUSTABLE BEARING CO., Inc.
Dept. M. Brazil, Indiana



Thirty-seven
BRANCHES

AHLBERG BEARING COMPANY
321 EAST TWENTY NINTH STREET, CHICAGO ILLINOIS

STUTZ SIX—It's a Great Car**STUTZ Speedway Four***America's Pre-eminent Sport Car*STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Ind.
Builders of the Original and Genuine Stutz Motor Cars**"UNICO" QUICK-SEATING "UNIC-OIL"**

Plain Step Cut

Oil-Control

PISTON RINGS

Ask for Samples and Prices

UNICO MOTOR PRODUCTS CORP., 4969 St. Louis Ave., St. Louis, Mo.

The new

**HOLLEY
HOT SHOT***for Ford cars***"Dimit"****Makes night driving safe**

A touch of the toe dims the lights. Simplicity itself. A remarkable seller. A necessity. \$2.50. For all cars. Distributors and Jobbers write at once.

THE DIMIT CO., 1121 Cathedral St., Baltimore, Md.

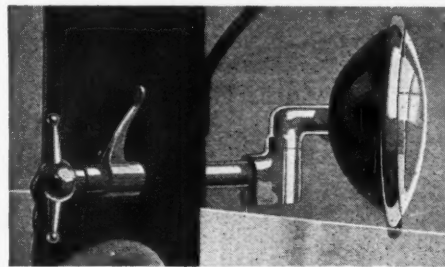
**Garage Tools**
make well equipped
shops. Ask your
jobber.Fast and ACCURATE for re-
facing, reseating and grinding
all size valves.Sioux Flexible Shaft and At-
tachments take the tool to the
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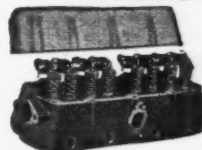
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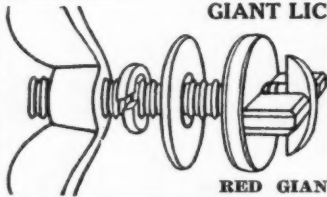
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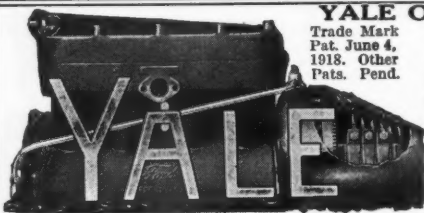
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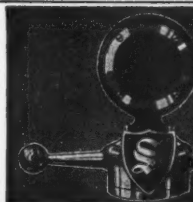
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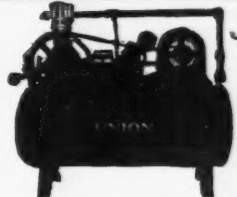
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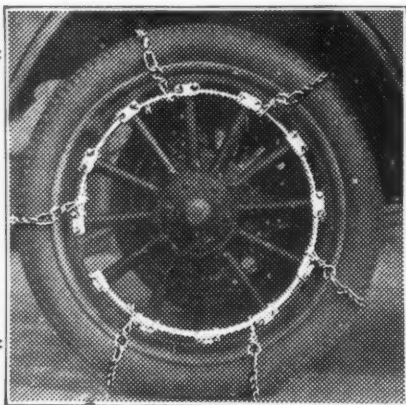
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Test These Battery Plates at Our Risk

Continental Dehydro Plates are First Basic Improvement in Forty Years

Not since Faure made the first storage battery forty years ago has a single fundamental improvement been made in storage battery plates until the process we are using was developed and successfully demonstrated. Capacity increase 25% and a 30% longer life are the outstanding results of the use of these new plates. We know this to be true, and we want you to prove it to yourself at our risk.

Meet Competition With These New Plates

The use of Continental Dehydro Plates in the batteries which you build give you a clinching talking point in meeting the stiff competition which you are up against. Repeated tests have shown that batteries constructed with Continental Dehydro Plates combine 25% greater capacity with 30% longer life, that they stand up easily under the strain of winter driving, that—in short—they will give the man who buys a battery constructed with Dehydro Plates one which he cannot equal anywhere else.

Heat Does It

Continental Dehydro Plates are subjected to super-heated steam under pressure. This treatment gives the plates unusual porosity with no impairment of the active material. The result is the achievement of the ideal plate in which extreme capacity and long life are at last successfully combined.

Special Offer—Enough for a Battery

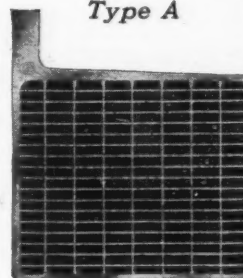
We want you to test these plates and see for yourself just how great an improvement Continental Dehydro Plates are over ordinary plates. We know how remarkable they are. We know that they have 25% greater capacity and 30% longer life. But we want you to see for yourself. Don't take our word for it; try them out, make your own tests, convince yourself.

In order to introduce Continental Dehydro Plates and to give progressive battery men a chance to test our claims, we are making this special offer on a trial order consisting of 18 negative and 15 positive plates—enough for one 33-plate battery.

Try Them for 30 Days

The price is \$5.00, free of all shipping charges—lower than the regular list price, f. o. b. St. Louis. Try the plates.

Type A



Assemble them in a battery, and then give the battery every test. If, after thirty days, it does not live up to all our claims, return the plates to us and we will refund your money without argument and without delay. You take no risk in trying out the first basic improvement in batteries in forty years. That's fair, isn't it?

Send the coupon now. Make your tests. Be among the first in your city to offer battery buyers better and more dependable batteries.

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St. Louis, Mo.

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CONTINENTAL BATTERY CO.,
3201-19 Papin St., St. Louis, Mo.

Gentlemen: I am willing to try your Dehydro Plates. I am enclosing \$5.00 (you pay transportation) for enough standard size plates to make one 33-plate battery. If I am not satisfied, you are to refund my money in full upon return of the plates.

Name.....

Address.....

My Jobber is.....



Double Diamond Gears

Right in your locality is a jobber who carries a stock of Double Diamond Gears. You can depend on him to give you quick, efficient service when you have a gear replacement job on hand. A wire, telephone call, or special delivery letter will bring the proper gear to you in a hurry.

Our nine sales branches are located in important distributing centers for the purpose of supplying jobbers quickly. Double Diamond "Nationalized Gear Service" is now built up to the point where every dealer and repairman can profit by it.

We also have a complete line of axle shafts, propeller shafts and pinion shafts, both in chrome nickel steel and carbon alloy.

Write to our nearest branch for price lists and the name of the jobbers in your territory.

Our 9 Sales Branches
Carry Complete Stocks.
Address Automotive
Gear Co. as follows:

ATLANTA
174 Spring St.
BOSTON
1024 Commonwealth Ave.
CHICAGO
1425 S. Michigan Ave.
CLEVELAND
6305 Euclid Ave.
LOS ANGELES
1213 S. Hope St.
PHILADELPHIA
1404 W. Girard Ave.
SAN FRANCISCO
818 Van Ness Ave.
SEATTLE
520 E. Pike St.
RICHMOND, INDIANA
Factory

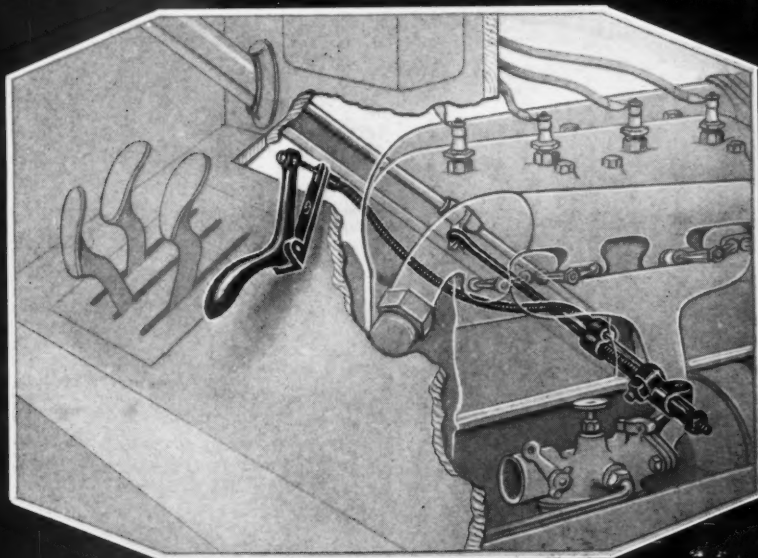
AUTOMOTIVE GEAR WORKS

Incorporated

Factory and General Offices
8th and South O. Sts.,
Richmond, Ind.

Export Office, 30 Water St.,
New York, N. Y., U. S. A.





*Make this New Year's
your resolution*

**Concentrate on
Williams Accelerators for 1924**

The two models, "Regular" at \$3.00—"Junior" at \$1.50 enable you with *one line* of accelerators to meet and master any price or quality situation that may exist in your territory.

Jobbers: Warehouse stock of Williams Accelerators and display stands is now carried in Chicago. Specify on requisitions if you wish shipments made from Chicago warehouse.

WILLIAMS BROS. AIRCRAFT CORPORATION
25th and Potrero Avenue San Francisco, California

WILLIAMS ACCELERATOR
for FORD CARS



“Stop!” says the Kit Cabinet

IT'S BETTER to heed this warning on the cabinet than to hear it from a policeman. A fine for driving without lights would be much more expensive than an Edison MAZDA Auto Lamp kit.


That's an argument your customers can't deny. They will readily see the wisdom of carrying a kit—and the cabinet will help to call their attention to it.

The kits have been multiplying lamp sales by selling five lamps at a time instead

of one. Now the kit cabinet is multiplying kit sales by stopping your customers and getting their attention.

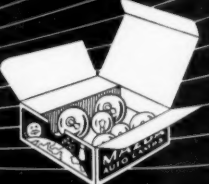
It is a small item, the lamp kit, but most of the biggest businesses in the world are those that have a fast turnover on small items. Pushing Edison MAZDA Auto Lamp kits will pay you, and there is plenty of advertising back of them to make it easy.

Your jobber can supply you with a kit cabinet while they last, or better still, write direct to The Edison Lamp Works of General Electric Company, Harrison, N.J.



EDISON

MAZDA LAMPS



A GENERAL ELECTRIC PRODUCT